TWO BOOK SERIES

TARR & McMURRY'S GEOGRAPHIES

ELEMENTARY GEOGRAPHY

HOME GEOGRAPHY

AND THE EARTH AS A WHOLE

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TARR AND McMURRY GEOGRAPHIES

FIRST BOOK

ELEMENTARY GEOGRAPHY

AND THE EARTH AS A WHOLE

BY

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*WITH MANY COLORED MAPS AND NUMEROUS ILLUSTRATIONS
CHIEFLY PHOTOGRAPHS OF ACTUAL SCENES*

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PREFACE

THIS is the first of a series of geographies; the more advanced treatment deals at greater length with the world and its inhabitants. Since Part I of the present volume is a radical innovation, it perhaps needs an explanatory foreword.

NECESSITY OF HOME GEOGRAPHY.—The final basis for all study of geography is actual experience. Yet text-books on that subject rarely treat Home Geography at all, and those that do, devote but few pages to it. This subject should, we think, receive far more careful attention.

NECESSITY OF OTHER BASAL NOTIONS. — Home experience alone, however, cannot offer a complete basis for the later study of geography, because no one locality presents all the features required. From this it happens that the best books have contained some definitions and illustrations, as of mountain, river, valley, harbor, and factory, and have planned to build the later text with the ideas these gave as a foundation. Such conceptions are certainly necessary in the early part of geography; but mere definitions fail to produce vivid, accurate pictures. The average pupil who has pursued geography for a year has little notion of the great importance of soil, of what a mountain or a river really is, of the value of good trade routes, and why a vessel cannot find a harbor wherever it will cast anchor along the coast.

Yet such ideas are the proper basis for the study of geography in the higher grades. The fact that they are so often wanting is proof that our geography still lacks foundation.

How these Needs are met. — The first 110 pages of this volume attempt to supply this foundation by treating first, such common things as soil, hills, valleys, industries, climate, and government, which are part of every child's environment; and secondly, other features, as mountains, rivers, lakes, and the ocean, which, though absent from many localities, are still necessary as a preparation for later study. Definitions, however, are not relied upon for giving the child this extra knowledge, but detailed descriptions and discussions instead. This by no means involves neglect of the child's own environment from the time the unfamiliar matter is introduced, for throughout the geographies home experiences are frequently used. We believe that our plan gives a fuller guarantee of fitness for advanced study than has heretofore been furnished.

Relationship to Mankind. — According to the definition of geography, — which treats of the relation between man and the earth, — a hill or a lake is worthy of mention only because it bears a relation to us, the men upon the earth; considered by itself it is not a part of geography. Therefore each chapter which takes up one of the above subjects, either closes with the bearing of the given topic upon mankind, or it deals with the human relationship throughout.

Earth as a Whole. — The most difficult portion of our task has been that which presents the Earth as a Whole. That a bird's-eye view should be given at an

early period in the child's instruction is not questioned; but it is not easy, in limited space, to support the principal facts with sufficient detail to produce vivid and interesting pictures. The authors have found that some topics commonly included in the early study, such, for instance, as latitude and longitude, should be postponed. They have also found that many other minor subjects usually presented are comparatively irrelevant to the geographical knowledge necessary to a pupil. By setting these aside for the time, space has been secured for a physiographic basis, and for a fairly close sequence in tracing the effects of physical conditions upon plants and animals, and also upon mankind. Throughout each chapter much care has been taken to present a closely related chain of thought, and at the same time to keep the leading facts in their proper foreground.

Suggestions for Further Home Study. — A study of books alone can never furnish an adequate knowledge of geography. Therefore it has been thought expedient to add numerous suggestions at the end of each section, in order to remind both teacher and pupil of suitable excursions, experiments, etc., and to show at the same time the breadth of the subject. In this way physical activity — the love of exercise — may be employed in the service of the study, and a habit of investigating the home environment encouraged.

Frequent Reviews. — Believing in the value of frequent reviews, the authors have suggested review material in frequent comparisons and contrasts, and in introducing new topics through others that have already been presented. This method has been used throughout this book, and in the more advanced treatment.

Maps. — The succeeding volumes in the series are not much larger than the present one. Our reasons for this marked innovation are that the old form is both unnecessary and unwieldy. The main excuse for the size of the common geography is the supposed need of large maps, a need which should be supplied by atlas and wall maps. This supposed requirement has led to the introduction of so many names, entirely unnecessary to pupils, that the purpose of a school book has generally been sacrificed to that of a cheap atlas. Why should a map, intended for school children, contain such Servian names as Valievo, Kragouyévatz, Ushitze, and Kruchevatz, four neighboring words upon an overcrowded map in one of the much-used geographies? Such piling up of names, which carry no meaning to the pupil and are distinguished by no idea, merely distract attention from the important names and features. Aside from that, the old form of geography is distinctly objectionable because of its size, which makes it difficult to handle and to carry. When open, it occupies nearly the entire surface of the desk; and, being so unwieldy, it is the most easily damaged of all the school books in use.

The most pertinent inquiry in regard to the maps of a text-book of geography should refer not to their size, but to their quality. In respect to the excellence of maps we challenge comparison. We believe that our maps are the best thus far printed in an American geography. While thoroughly artistic, they cause the *essential* features to stand out with surprising distinctness. Contrary to the usual custom, the political maps include the principal physical features, so that any place is always seen in connection with its physiographic surroundings. The

colors have been so selected as to secure harmony, and at the same time to show the boundaries clearly. Unimportant names are excluded, even where space might have permitted their introduction; and, to an unusual degree, the size of print is proportionate to the importance of places, so that the names of leading divisions, cities, etc., can be distinguished at a glance.

ILLUSTRATIONS. — The illustrations have been selected with great care to illustrate specific points; and for the sake of accuracy, photographs have in most cases been employed. They are not inserted merely for the purpose of entertainment, but in every case bear a direct relationship to the text. They are not intended as mere *pictures*, but as *illustrations;* and being numbered and referred to frequently, they pay for their space by contributing materially to the book's fund of instruction.

ACKNOWLEDGMENTS. — The photographs have been obtained from many sources; the globe drawings were made by Mr. Murray of the Matthews-Northrup Co.; and the other drawings were mostly prepared by Mr. C. W. Furlong, instructor in Cornell University. The maps have been prepared by the Matthews-Northrup Co. of Buffalo, who have obtained an enviable reputation as map engravers for the Century Atlas.

The authors of this book are responsible for any shortcomings that it may prove to have. They have had the benefit of much criticism of the best sort. Space does not permit them to refer to each one who has kindly extended aid; yet mention should be made of the exceedingly valuable criticisms and suggestions of Mr. Philip Emerson of the Cobbet School, Lynn, Mass.

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PART I

HOME GEOGRAPHY

I. THE SOIL

YOU have often played in the dirt. Did you ever stop to think what it is made of? It was not always what it now is. You know that the wood in your desk was not always a part of the desk; it used to be part of a tree, and has a long story to tell about itself before it was brought to your school. So all the dirt or *soil* that you have ever seen has a long story to tell about how it became what it is now. Let us see what that story is.

When mud dries upon your hands and you rub them together, you can notice an unpleasant, gritty feeling. This is caused by the scraping together of hard bits of something in the soil. If you rub some of this dirt against a smooth piece of glass, you can often hear it scratch the glass. This shows that these little bits must be very hard, for if they were not, they could not scratch anything so hard as glass. They must be even harder than a pin, for you cannot scratch glass with a pin.

It will help you to find out what these bits are if you examine some sand. The grains in it are tiny bits of rock, large enough to be clearly seen. When they are

rubbed against glass, they scratch it, because they are hard and sharp.

Sand is made of rock that has been broken up into very fine pieces. Soil is also made of rock, but the pieces are finer still. The soil that you have seen, such as that in the schoolyard, or by the side of the walk, was once rock.

Soil has been made from rock.

Since soil is found almost everywhere, you may wonder how so much rock has been changed to it. The answer is not hard to find. Did you ever pound a brick up into bits until you made brick-dust? You can change a stone to dust in the same way. Break one into small bits and see how much it resembles dirt.

Sometimes one sees men drilling holes into stone; the tiny pieces that are broken off collect in and round the hole, and look much like dirt. When a grindstone is used to sharpen tools, small pieces of the stone are ground off, and if water is poured upon it, this dust makes the water muddy, just as soil would.

Much rock has been changed to dirt by the rubbing of pieces of stone against one another. In this way tiny bits have been worn off, as chalk is worn away when rubbed against the blackboard, or slate pencils against the slate. Perhaps some of the dirt that you have seen has been made in this manner. Later you will learn about the glaciers which have caused much of this rubbing.

The grinding of rocks together has made much soil.

But this is not the only way in which rock has been changed into soil. Much of it has decayed and fallen to pieces as wood does. You know that, after a long time, stumps of trees, and the boards in sidewalks, grow so

soft that they fall to pieces. Perhaps you have called it *rotting*, but this means the same as *decaying*. The picture (Fig. 1) shows such a stump.

Fig. 1.
A decaying stump of a tree.

Other things even harder than wood decay in much the same way, although perhaps more slowly. Hard nails, at first bright and shiny, decay until they become a soft, yellow rust. Iron pipes and tin pails rust until holes appear in them and they leak.

You may not have thought that stones also decay, but they do. The headstones in old graveyards are often so crumbled that the letters can scarcely be read, and sometimes the stones have even fallen apart. The decay of rock may also be seen in old stone buildings, boulders, and rock cliffs. Have you ever noticed this?

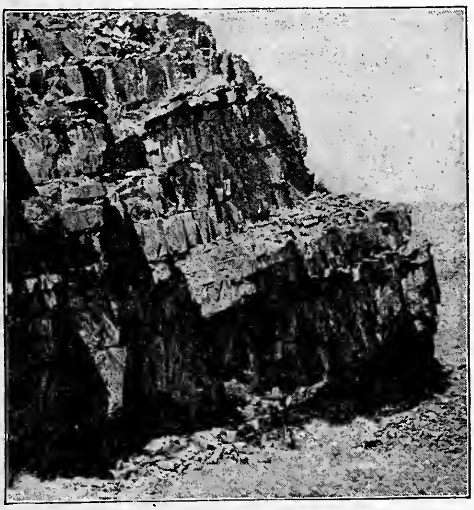

Fig. 2.
A rocky cliff containing many cracks. Point to some of them.

Soil has been formed, also, by the decay of rocks.

There are several things that help to cause this decay. All rocks have cracks in them (Fig. 2). Usually some of these are so large that they can be plainly seen; but there are many others so tiny that they cannot be seen

without a magnifying glass. When it rains, the water steals into them, and by eating and rotting the rock, very slowly changes it to a powder.

The water may also freeze in these cracks and pry the stone apart. If you have seen iron water pipes, or water pitchers, burst in cold weather, you know how this is done. Some of the pieces of rock pried off in this way are very small, others quite large (Fig. 3).

Fig. 3.

Pieces of rock broken from a cliff by the weather. Can you also see the cracks in the rock of the cliff? Find some broken pieces in Fig. 2.

Plants help the water in this work. In search of food they push their hair-like roots into the cracks, and there remain until they grow so large that they also pry off pieces.

The earthworms that you may often see after a heavy rain also help in crumbling the rock. In order to get food, they take soil into their bodies and grind the coarse bits together until they become very fine.

Water stealing into the cracks causes rock to decay and crumble. Plants and earthworms also help to break it up.

Rock changes to soil most rapidly near the surface; for the rain, roots of plants, and earthworms can reach it more easily there than elsewhere. So the deeper into the earth one goes, the less the rock is changed (Fig. 4); and, no matter where you live, if you should dig deep enough, you would come to solid rock.

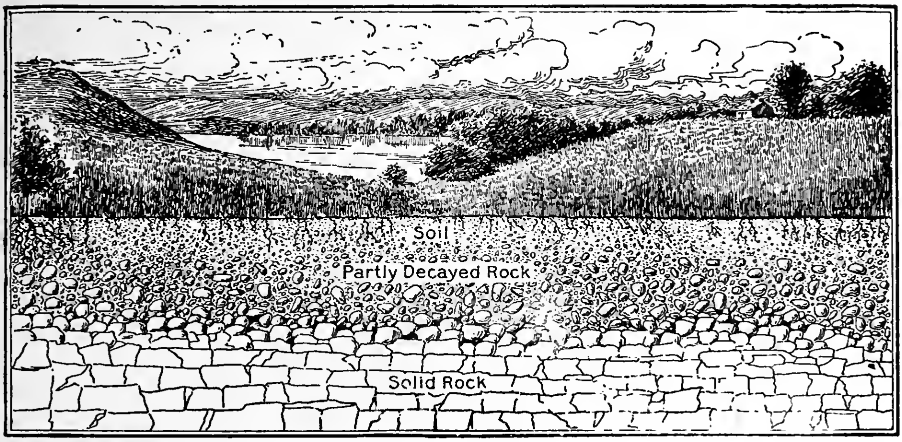

FIG. 4.

A section, as if the earth were sliced through, like a loaf of bread, so that the part below the surface is seen. Tell what you see in this picture. Notice the roots of the tree on the left side.

Figure 5 shows soil about one and one-half feet deep. Sometimes there is much more than this, and men may

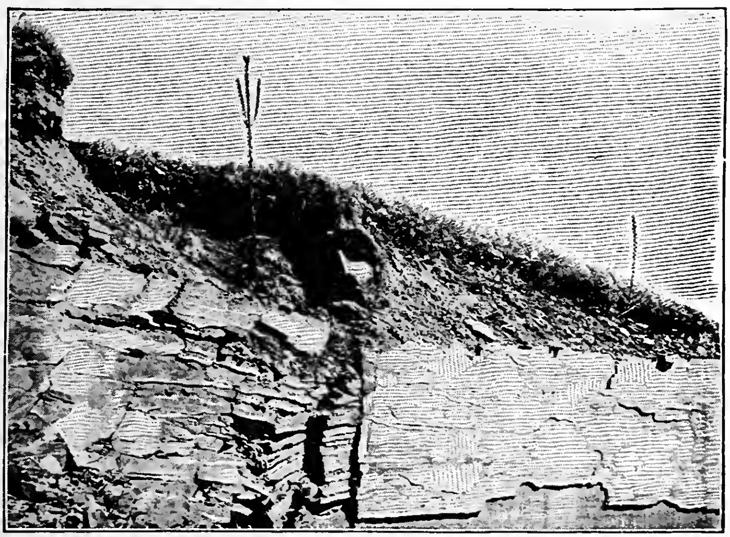

FIG. 5.

A picture showing solid rock beneath the soil. Notice the cracks in the rock.

even dig deep wells without finding rock; but in many places there are only a few inches of soil, or, sometimes, not even enough to hide the rock.

One reason for such differences in the depth of soil is that some rocks decay more easily than others. Another reason is that in some places the rain washes the bits away as fast as the rocks crumble. This may leave the rock quite bare in one place and make the soil very deep in another.

There is solid rock beneath all soil.

How different it would be if no rock had ever changed into soil! There could then be no grass, flowers, or trees around your home, because they grow by means of the food that they get from the soil.

Without grass there could be no cattle, horses, or sheep; in fact, few animals such as are found upon the land could live; for what would they eat? What, then, could you yourself find to eat? There would be no vegetables, no bread, butter, and milk, and no meat. You see that, if there were no soil, few people could live; so that the dirt under our feet is a very valuable substance.

Without soil, few plants, animals, or people could live on the land.

Soil is needed by plants because it holds water. They become thirsty as well as you. Where the dirt is only a few inches deep, it may dry out on hot summer days, and then the plants die; but where it is deep, the roots may reach down several feet till they find damp earth.

It is surprising how long the roots of some small plants are (Fig. 6). For example, the clover in the picture is less than a foot high, but its roots are longer than you are tall. They reach so deep down that even in dry weather the clover is green while other plants, with shorter roots, are withered and dry. Some trees push their roots

down a greater distance still. Can you find out how long the roots of any weeds are?

The soil holds food, as well as water, for plants. In it is found something which plants need, and which they take up through their roots; it is a part of the soil itself, and is called *plant food.* Each blade of grass and each limb of a tree contains some of it; and when a piece of wood is burned, some of this food is left behind in the ashes.

Fig. 6.

Some of the roots of the clover that the boy is picking have reached out into the air through the side of the bank. They were seeking water.

Every person even has a quantity of it in his body; your bones and teeth are partly made of it. But you did not take it directly from the soil; the plants took it for you, and you received it from them in flour and other foods that you have eaten.

Soil furnishes water and food to plants.

All plants do not need the same kind of food any more than all animals do. Horses eat hay and grain, while dogs eat meat; so some plants need one kind of food, others another. These different kinds of plant food are found in the different kinds of soil, of which there are very many.

For example, some soils are fine, while others are coarse, because some rocks have crumbled to finer bits than others. Then, too, there

are many kinds of rock, such as granite, marble, and sandstone; and when they decay they make different kinds of soil.

In some places great numbers of plants have grown up and died. During their growth they took substances from the air, as well as from the soil, and when they died and decayed they returned some of these to the soil. These plant remains have become mingled with the soil, making it dark and sometimes almost black. In some places this dark-colored layer may be several feet deep, as in forests, or in swamps, where plants have been growing and decaying for hundreds of years. This is an excellent soil for farming, because it produces large crops.

There are many different kinds of soil.

Soil that has much plant food in it is said to be rich or *fertile;* if it has little, it is said to be poor or *sterile.* The plants are taking away some of this food; they are really robbing the soil. But when weeds and trees fall and decay on the spot where they grew, they pay back what they took away. In fact, some of this food is returned to the earth every autumn when the leaves fall from the trees.

But if plants are carried away from the spot where they grew, there is danger lest fertile land shall be robbed of so much plant food that it will become sterile. Now this often happens; for farmers send away their wheat to make flour, and haul their corn, hay, and oats to market. Some farmers have done this for so many years that they are no longer able to support their families on their land, but have been obliged to move away to find other farms where the soil has not been robbed of its plant food.

The wise farmer takes care to put some plant food back upon the soil to pay for what he has taken, so that he may continue to raise good crops. That which he puts back upon the soil is called a *fertilizer*, because it keeps the soil fertile. People in the city often use a fertilizer to feed the grass of their lawns and keep it green.

Fertile soil may be robbed of its food and become sterile.

Review Questions. — (1) Of what is the soil made? (2) How can you show that the little bits in it are hard like rock? (3) What happens when rocks are rubbed together? (4) If you have ever seen rocks that were decaying and crumbling, tell about it. (5) How does water enter rocks? (6) What happens when water freezes in the cracks? (7) What else helps to crumble the rocks and soil? (8) What is beneath the soil? (9) Make a drawing, like Fig. 4, showing the rock beneath the soil. (10) Tell about the depth of the soil. (11) Why is there no soil in some places?

(12) Why is the soil worth studying? (13) Name two things that plants take from it. (14) Of what advantage is a deep soil? (15) Do all plants want the same kind of food? (16) What causes the different kinds of soil? (17) What has made some soils so black? (18) What is fertile soil? (19) Sterile soil? (20) How are some soils robbed of their plant food? (21) What is used to make them fertile once more? (22) Tell what you see in Figs. 1, 2, 3, 4, 5, and 6.

Suggestions for Study at Home and out of Doors. — **Here are things, some of which, at least, you will be able to see or do for yourselves**: (1) Find a place where men are digging a ditch or cellar, to see how the dirt looks below the surface. (2) Find a boulder, cliff, old stone wall, or an old headstone in a graveyard, and see if the stone is crumbling. (3) Break some pebbles open to see whether or not they are decayed on the outside and fresh within. (4) Change a stone to dust. (5) Collect several different kinds of soil. (6) Plant beans in each kind, at the same time, and see in which one they grow best. (7) See what the effect would be if no water were given to some of them. (8) Find out what trees and vegetables grow best near your home. (9) What do the farmers prefer to raise? (10) Go to a hot-house to find out what kind of soil is used there, and what is done to keep it fertile. (11) Visit a gardener or a farmer to find out how he cultivates the soil. (12) How many articles can you name, as crockery, for example, that are made of soil or clay? (13) Write a short story about the soil.

For References, see page 108.

II. HILLS

The soil that has been formed from rock has not been left smooth and level like a floor. The surface of the land is usually uneven or rolling; and even those places which at first sight appear level, are really sloping (Fig. 7). Beside such gentle slopes, there are many

Fig. 7.

A very level plain; but since a stream is flowing through it, there must be slope.

others steep enough to allow coasting in winter, and others still that are much too steep for this purpose. In other words, *hills*, some gently sloping, some steep, are found almost everywhere upon the surface of the earth (Fig. 8).

These hills have not always been here. Even the ones you may have seen and climbed have been slowly made. Let us see what has caused them.

When it rains slightly, the water soaks into the ground and disappears; but when there is a heavy rain, all of the

water cannot sink into the soil as rapidly as it falls. Some then begins to flow away. One little stream, perhaps hardly an inch wide, begins at one point; another joins it; quickly several of them unite, and soon a good sized

Fig. 8.

A picture in a hilly country. The surface of the lake is level; but the hills, some steep, others gently sloping, are very irregular.

brook or creek is formed. Have you not noticed this flowing water in the school yard, in the roads, and on the sides of hills?

But did the water flow off without taking something with it? Was it not muddy? This means that soil had become mixed with the water and was being borne away. Every heavy rain bears along much soil, cutting out little channels, washing out roads, and perhaps even destroying the beds of railways, so that trains must stop running for a time.

During such a rain little channels, or *valleys*, and tiny *hills* and *ridges* are carved in the soil (Fig. 9). No doubt you have seen these formed very many times. If not, you can easily make them by pouring water from a sprinkler upon a pile of loose dirt.

There are many heavy rains every year, and in a lifetime their number is very large. During many hundreds of years, then, the water could wash away an enormous

amount of soil and rock which the large streams and rivers would carry away to the sea. By this means deep valleys have been formed, with hills between them, much as the tiny channels in the school yard are cut in the dirt by the rain water.

Then, also, some rocks are not so hard as others, and the softer ones, as they break up, are naturally carried away faster than those that are harder. This leaves high ground where the rocks are hardest.

FIG. 9.

Little hills and valleys cut in the soil by heavy rains. Point to some of them.

What a change water must have made in the appearance of the surface of the earth! No doubt, in the very beginning there were hills and valleys; but every year, for thousands of years, these have been slowly changing, so that they are now very different from what they were long ago. And after many more years they will be very different from what they now are, for they are even now changing.

Most hills have been carved out by running water.

In every neighborhood there are hills, although they may not be very high. The picture shows one with a somewhat gentle slope

(Fig. 10). If a person were to walk up this hill, going from its *base* to the top, or *summit*, he would walk more than a mile; but this, of course, does not mean that the hill is a mile high.

For example, in Fig. 11 you see a board ten feet long, with one end resting on the ground and the other on a fence four feet above the ground. If a person starts at the lower end and walks to the upper end, he travels ten feet; but he is then only four feet above the ground.

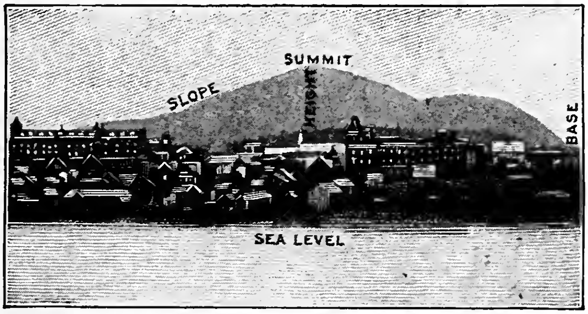

FIG. 10.
To show the difference between the slope of a hill and its height.

The height of a hill is much less than the length of its slope.

Perhaps you have heard that it is colder on the summit, or *crest*, of a high hill than at its base. If one takes a thermometer with him when going to the top of the

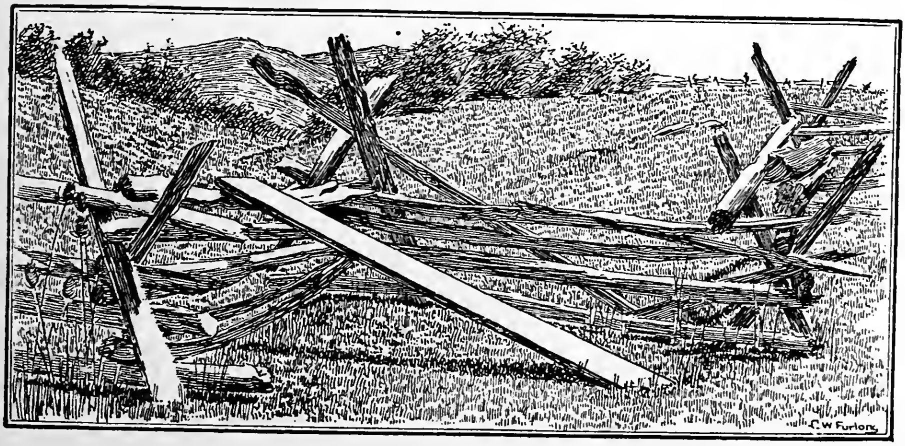

FIG. 11.

Washington Monument (Fig. 85), which is 550 feet high, he finds that it is about two degrees colder at the top than at the base. One might not notice any difference in climbing low hills, but it can be easily noticed on high ones; and if your home is near one, you can prove this.

People who live where there are high hills often observe that it snows upon them while it rains upon the lower ground at their base (Fig. 12). Explain why this is so.

It is colder at the crest of a hill than at its base.

FIG. 12.

Do you see any reason for thinking that it is colder near the summit of this high mountain than at its base? This is Mount Chimborazo in South America, where it is very hot in the lowlands.

Many people prefer to build their houses upon hills, partly because the air is cooler and fresher in summer; but another and more important reason is, that it is more healthful to live on this high ground. Where the land is low, the slope is often so gentle that the water cannot flow off readily, so it stands, sometimes making wet places called *swamps* (Fig. 33). Houses in such places often have cellars and foundation walls that are damp, and the people who live in them are in danger of fever, and of other kinds of sickness caused by this dampness.

But the water usually runs quickly away from a hill, so that even after a heavy rain the ground soon becomes dry. In large cities, where land is very expensive, people build almost anywhere; but in these cities there are so many drain pipes, or *sewers*, to carry off the water, that even the low places are quite dry.

FIG. 13.

A castle built upon the brow of a high hill.

In times past some men were in the habit of building great castles, with thick walls, on the crests of hills (Fig. 13). From these they could look out over the country for a long distance and spy approaching enemies in time to prepare for them. Then, too, the steep sides of the hills were difficult for the enemy to climb, so that the people living in castles on hilltops were quite safe.

Some of the Pueblo Indians built their towns upon the tops of steep hills in order to be safe from the more savage Indians who attacked them. For much the same reason the Puritans, many years ago, were in the habit of building their churches upon the hilltops.

Hills at present are little needed for such a purpose; but there is another reason why people like to live upon them. From their tops they can look out over the fields for long distances and enjoy the beautiful views. Have you yourself ever enjoyed such a view?

People like to build their houses upon hills, because it is healthful there and the views are beautiful.

Review Questions. — (1) Is there much land that is really level? (2) What do you understand by rolling land? (3) Were the hills that you know always there? (4) Have you seen water carrying away soil? If so, tell about it. (5) Explain how hills have been made.

(6) What is the base of a hill? (7) The summit? (8) Tell what you learn from Fig. 10. (9) From Fig. 11. (10) Make a drawing somewhat like Fig. 11. (11) On what part of a hill is it coolest? (12) How could you prove it? (13) Why does it often snow on hills while it rains on lower land near by?

(14) What is a swamp? (15) Why should not houses be built on swampy ground? (16) Why are hills liable to be dry? (17) Why is the lowland in cities usually so dry? (18) Why have castles often been built on hills? (19) Why did the earlier settlers place their churches on hills? (20) What other reasons can people have for wishing to look far out over the country?

Suggestions for Study at Home and out of Doors. — (1) Find some ground about your home that seems nearly level. Is it really level? (2) Where is the longest slope in your neighborhood? The steepest one? (3) Watch the water carrying off soil after a rain. Where does the soil go? (4) Write a story about it. (5) Hunt for a washout after a heavy rain. (6) Where is your highest hill? (7) In what season of the year is it especially pleasant to live on a hill? Why?

(8) Can you find any houses built on low, wet soil? (9) Are their cellars ever very damp? (10) Ask some doctor why one should not live in such places. (11) Find some pictures of castles, showing their location. (12) Is your schoolhouse upon a hill? (13) Name any houses in your neighborhood that stand on a hill. (14) Where is your most beautiful view? (15) Do your friends agree with you that it is the most beautiful one?

For References, see page 108.

III. MOUNTAINS

You may never have seen mountains, but you have certainly seen something that looks much like them. Often, on a summer evening, the sun sets behind great banks of clouds that reach far up into the sky. Some of them have rough, steep sides, and great, rugged peaks,

FIG. 14.
A mountain scene.

while others have more gentle slopes, and rounder tops. Oftentimes there are many of them together, and they are so real that it seems as if one might climb their sides if he could only reach them.

This is very much the way snow-covered mountains appear in the distance; in fact, the resemblance is so close that, when one is at a distance from mountains, he must often look carefully to note whether he is looking at real mountains, or only at clouds in the sky.

The mountains in Fig. 14 are much like hills, except that they are larger. Hills are seldom more than a few

hundred feet high, while these mountains rise two or three thousand feet in height. Some mountains are so low, and their slopes so gentle, that one is able to climb to their tops without much trouble. Such mountains are often called hills. But many others are even two or three miles in height. Their *peaks* rise far above the clouds and are often wholly hidden by them, as in Fig. 15.

Fig. 15.

A mountain peak in Switzerland, with snow on its sides and base, and a small cloud hiding the very summit.

Usually where there is one mountain peak there are others near by (Fig. 16). They often extend a long distance, perhaps hundreds of miles,

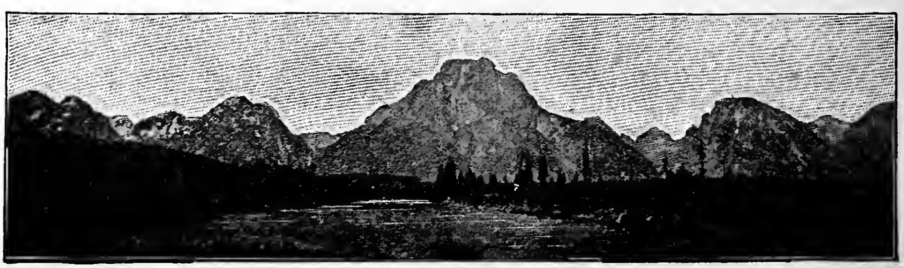

Fig. 16.

A number of lofty mountain peaks near together.

forming what is called a *mountain chain*, or a *mountain range*.

Such great ranges have not been carved out by running water, as hills have been. In fact, real mountains are found only where parts of the land have been slowly raised or lowered until some portions are much higher than the surrounding country (Fig. 17). Among these mountains, as elsewhere, running water has of course cut out many valleys.

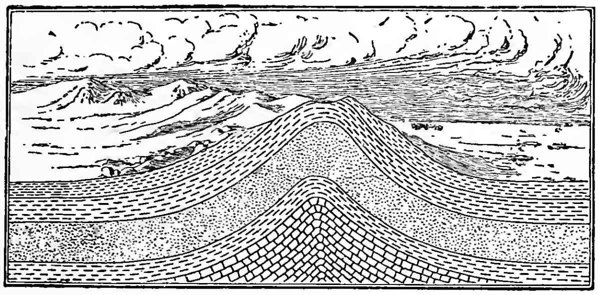

FIG. 17.

This is a drawing of a mountain range sliced through so as to show the layers of rock that have been pushed upward.

You can imitate mountain folding by crumpling a number of sheets of paper. The reason for this folding of the rock layers will be found stated on page 125.

Mountains are masses of rock that have been pushed above the level of the surrounding country.

Men often climb to the tops of mountains. It might seem that this would not take a very long time, nor be very difficult; but to go to the crest of even a low mountain is often quite a task. Upon a level road one can easily walk a mile in less than half an hour. But it might require a whole day of steady climbing to reach the summit of a mountain only one mile high.

It would be a long journey even if one could go in a straight line to the top. It has already been stated (p. 13) that to climb a hill two or three hundred feet high it is necessary to walk a longer distance than this. The same is true of mountains.

Most mountains are so steep that one would grow very tired climbing directly up their slopes; so a much longer, zigzag path is usually followed. Then, too, there are often steep *cliffs*, or *precipices*, that could not be climbed (Fig. 18), and one must travel round these to find a place where the slope is gentle. This makes the path still longer, so that to climb a mountain one mile high it might be necessary to walk ten miles, or even more.

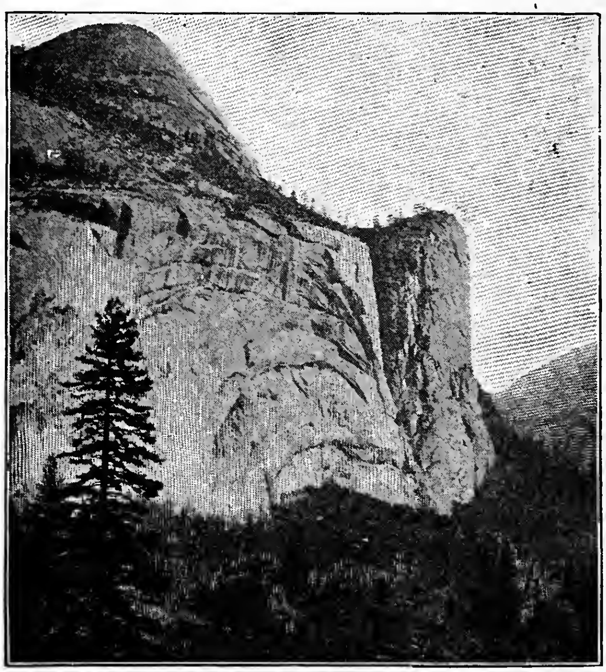

FIG. 18.

A mountain precipice in the Yosemite Park among the Sierra Nevada Mountains of California. No one could possibly climb the face of this steep rock cliff.

If the air is colder at the crest of a hill than at its base, one might expect that it would be *very much colder* on the top of a high mountain, and this is true (Fig. 12, p. 14). In fact, it grows so much colder near the summit of the higher mountains that it *never* rains there, but snows instead; and it may even be so cold that trees cannot grow there (Fig. 20, p. 23).

It is a long distance to the top of a high mountain, and the air is cold there.

Many people cross the ocean to visit the Alps Mountains in Switzerland; but while they enjoy climbing about on the sides, and looking at the beautiful views, very few ever reach the summit of the higher peaks. Mont Blanc is one of the best known of these, and is nearly three miles in height. (The picture, Fig. 20, shows views of Mont Blanc.)

It is very difficult, and even somewhat dangerous, to climb to the summit of this mountain. When a person wishes to do so, he must employ guides to help him over the difficult places.

The round trip usually takes two nights and three days; as there is no place to obtain food high up on the mountain side, it is necessary to carry it. Overcoats and blankets are also necessary; for even though the journey be made in the hottest summer weather, it will be bitterly cold upon the mountain top.

Suppose that we are making such a journey. We start early in the morning so as to have a long day. Each of us carries a few light articles, but the guides and porter carry most, for they are strong and used to climbing.

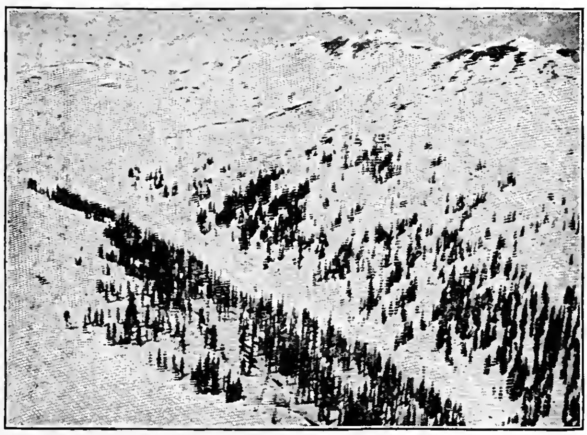

Fig. 19.
A picture of the timber line on the snowy slopes of a mountain in Colorado.

At first we walk along a pleasant path in a beautiful wood. A house is occasionally passed (Fig. 20, G), and perhaps a green field. But soon there are no more houses and fields, and the trees become smaller and smaller until the line is reached above which it is so cold that no trees can grow. This is called the tree line or *timber line* (Fig. 19).

From this point on, no plants larger than bushes are seen, and after a while even these disappear. Meanwhile the soil and the grass have become more scarce, while here and there banks of snow are found in

the shady hollows. Soon we have climbed to the *snow line.* This is the line above which snow is found all the year round. Now, no matter in what direction we look, rock and snow are everywhere to be seen, the latter often being hundreds of feet deep (Fig. 20, F).

What a beautiful view before us! It repays us for all the hard work. We look down upon the woods through which we have just passed; then, over beyond them, to the deep valleys, with the green fields, pretty houses and villages far below us; and, beyond these, to the other steep mountains upon the opposite side of the valley.

The guide takes his place in front of us, and often tells us to stop while he goes ahead to examine the way. It may be that the snow has bridged over and hidden a deep and narrow chasm, so that if one were to step upon this snow he might fall through.

Sometimes the guides lift one of us over a dangerous place; and, when it is steep or slippery, fasten all the members of the party together with ropes (Fig. 20, E), so that if one falls, the others may hold him.

As we advance higher and higher, it is often necessary to take a narrow path on the steep side of the mountain. On the right you can look hundreds of feet almost directly downward; on the left are great stones and masses of snow almost directly overhead.

The snow sometimes falls, forming snow slides or *avalanches*, which are very dangerous. They come tearing down the sides of the mountains with a terrible roar, burying whole villages beneath them. You have seen the same thing, on a much smaller scale, when snow has slid from the roofs of houses on warm winter days.

After one night spent in a little house about halfway up the mountain side, and after much hard work on the next day, we reach the summit (Fig. 20, A). Here, in spite of our wraps, we are all shivering; for upon high mountain summits there are fierce winds which seem to go through even the thickest cloth.

On this barren mountain top there are no birds, no trees, no grass: nothing but snow and rock; but if it is a clear day, and there are no clouds clinging to the mountain sides below, we may be able to look down into the beautiful green valleys, only a few miles away. There the birds are singing, flowers are blossoming, and men, working in the fields, are complaining of the heat.

It is a difficult and dangerous journey to the top of a high mountain.

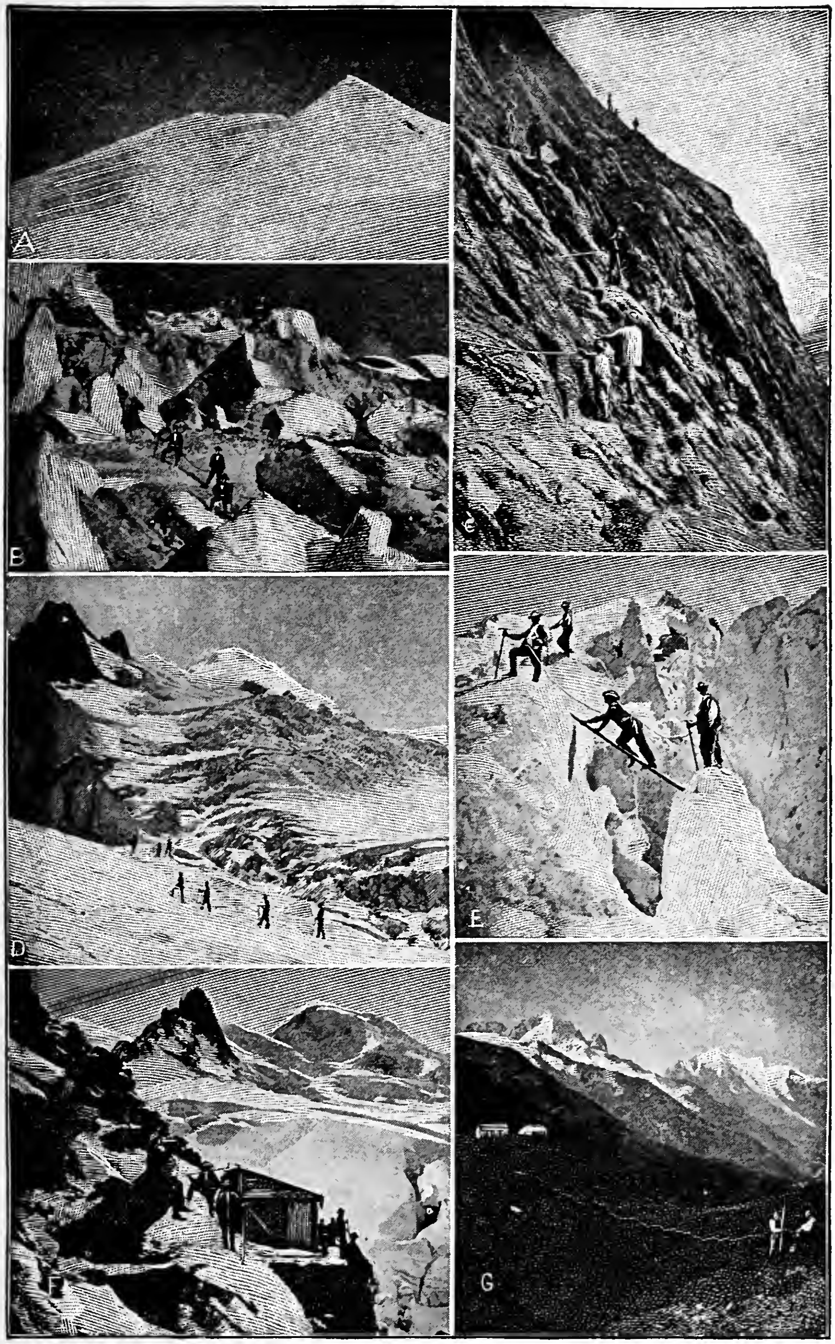

Fig. 20.

Seven photographs taken on a journey to the summit of Mont Blanc. See if you can find in these pictures any of the scenes described.

It is by no means so difficult to reach the summits of all mountains. Many of them (Fig. 14, p. 17) are so low that there is no snow upon them in summer, and trees live and thrive even at the top. Roads may have been made to the summit, so that one may drive up instead of walking.

FIG. 21.

A hotel at the base of a lofty mountain at Banff, on the Canadian Pacific Railway, in British Columbia, Canada.

Among some of these mountains hotels are built (Figs. 21 and 24), to which people go in summer to escape the hot weather. There they may walk through the woods, and climb to many interesting places, where fine views are to be had.

Mountains are important summer resorts.

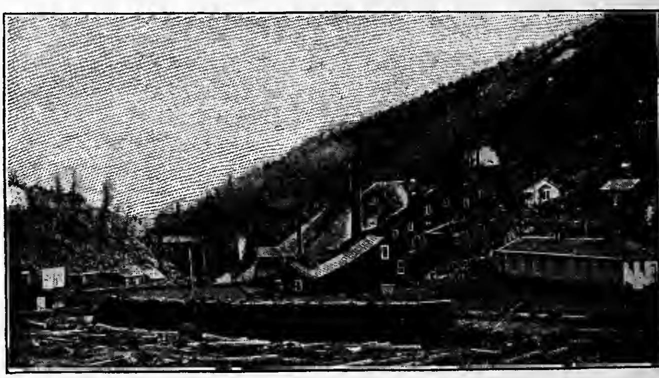

FIG. 22.

Here men are digging gold ore deep in the mountain side. The ore is hoisted to the surface and crushed to bits in these buildings, so that the particles of gold can be separated from the rock.

Perhaps you already know that the rocks in-

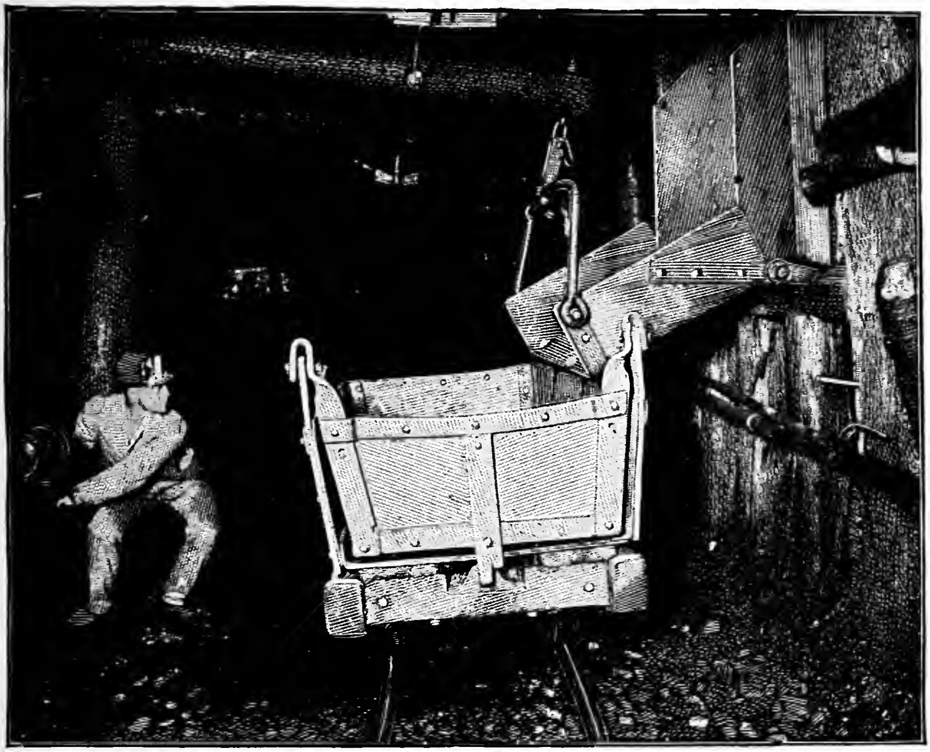

FIG. 23.

This man is deep down in the earth in an iron mine. He is preparing to load the car with ore which other miners have been digging in a tunnel just above, on the right-hand side.

side the mountains sometimes contain gold and silver (Fig. 22). Iron, lead, and other *metals* are also found there. When they are dug out from the rocks they are *ores*, which do not look much like these metals as we know them. But the metal in the rings, watches, and silver dollars that you have seen, and even the iron parts of your school desk, may have come from the rocks of some mountain (Fig. 23).

The trees in the mountain forests are also valuable. The most common kinds are evergreens, such as the pine, hemlock, and spruce, which are green even through the winter, and which can live on the cold mountain sides as far up as the timber line.

The land upon a mountain side is usually too steep and rocky for farms. But even where farms are not possible, trees often grow finely, covering the mountain for miles and miles with dense forests. This is fortunate, for the trees may be cut down and sawed into lumber, from which all sorts of wooden articles are made. Possibly the very seat in which you are sitting was once a part of a tree that grew on the side of a mountain.

Mountains are of further use because of the abundance of water that they supply. We have already seen that there is much ice and

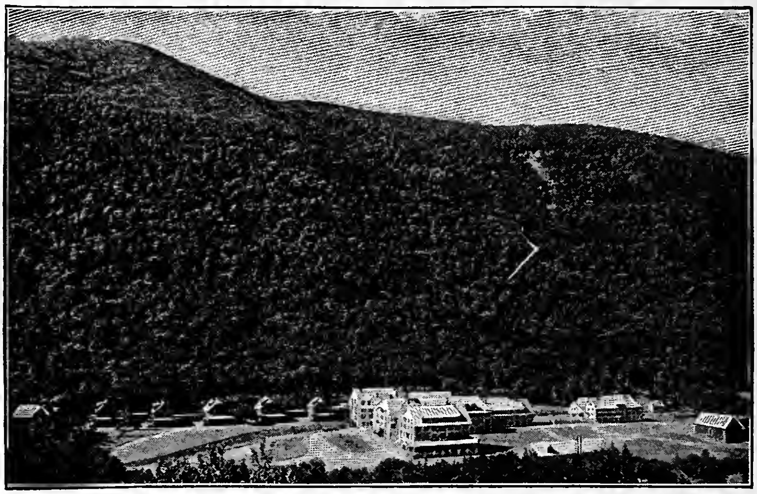

Fig. 24.

The forest on the sides of the White Mountains, New Hampshire. The large buildings are the hotels of a summer resort.

snow upon some of them; in fact, there is so much upon the higher ones that it can never all melt away, no matter how hot the summer may be.

During hot weather many streams dry up; but at such times the ice and snow of the mountains only melt the faster, so that the streams which flow forth from these mountains are even more swollen than usual. This water may run along for many miles until it finally reaches towns and cities where people need it to drink. Do you know of any city that gets its drinking water from such a river?

Mountains furnish metals, lumber, and water.

Review Questions. — (1) What can you say about the height of mountains? (2) How have they been made? (3) What is a mountain chain or range? (4) How long might it take to climb a mountain a mile high? (5) Why so long? (6) What can you tell about the cold at the summit? (7) How do the trees change in appearance as one mounts higher and higher?

(8) What would you need for a journey up Mont Blanc? (9) Describe the first part of the journey. (10) What is the timber line? (11) What is the snow line? (12) What are avalanches? (13) Describe the view from the top of the mountain.

(14) Mention some reasons why mountains are favorite summer resorts. (15) What kinds of mines are found in mountains? (16) Why is it fortunate that trees grow so well on mountain sides? (17) What is done with them? (18) Tell what you can about the streams that flow from mountains.

Suggestions. — (1) Watch for clouds that resemble mountains. Make a drawing of them. (2) Find pictures of mountains; note the timber line, the snow line, and other points of interest. (3) Represent a mountain in sand. Show the tree line; the snow line; steep and gentle slopes. (4) Represent a mountain range in sand. (5) In what direction are the nearest mountains? What are they called? How far away are they? Find out an interesting fact about them.

(6) Ask some one who has climbed a mountain to tell you about it. (7) Would you care to climb one yourself? Why? (8) Write a story relating the adventures you would expect in mountain climbing. Describe some of the views you would expect to find. (9) Why do few people live high up on the mountain sides?

(10) Examine a piece of ore (in some museum) and find out how the metal is taken from the rock. (11) Start a collection for the school by bringing some ores. (12) Hunt for pictures of woods on mountain sides. You will find several in this book. (13) Find some pictures which show gorges cut in the mountains by running water. (14) Find out some facts about glaciers.

For References, see page 108.

IV. VALLEYS

We have seen how water is always washing away soil, making hills and changing their appearance. Wherever hills are found there are always low places or hollows, and these are called *valleys*.

Fig. 25.
A beautiful stream in a wooded valley.

Some very small valleys you have already seen in Fig. 9. They are only a few inches wide, and the tiny hills or ridges between them are only a few inches high.

Every stream of water, whether great or small, when flowing over soft earth, is carrying some of it away and forming valleys. Even when flowing over hard rock, the water is doing the same thing, but more slowly. It grinds the rock away by dragging pebbles and grains of sand over it, thus scouring it out. This work of the water is never finished, for every rain is slightly changing the valleys.

Are there any valleys in your neighborhood? Do you live in one? If you have travelled on the railway, you have certainly seen many of them. Figures 11, 14, and 25

show valleys. Can you find others in the book? In Fig. 25 is shown a small stream with the land on either side gently sloping toward it.

Since there are very few places without slopes and hills of some kind, there must be few places without valleys. Although some of these are narrow, others are so wide that one cannot see across them.

Wherever two downward slopes come together, a valley is formed, whether the slopes be long or short. In those that you can find, notice the difference in the slopes. If in one of the valleys there is a stream, notice the direction in which it flows. Why does the water flow at all? Which way is *down the valley?* Point *up the valley.*

You see, of course, that valleys have not only width, but length. Many of them are only a few inches long, and you can certainly find some of these. Perhaps your home is in a valley that is many miles in length. Find out if this is true.

Most valleys have been cut out of the land by running water.

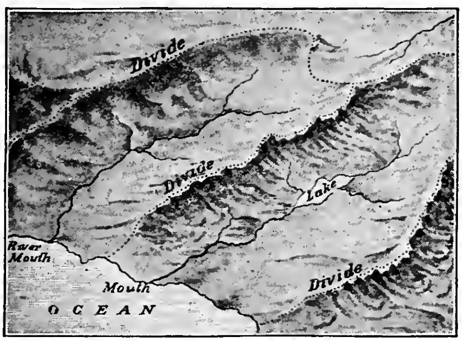

FIG. 26.

The dotted lines show the divides between the valleys. Trace them. What else do you see in the picture?

In the picture (Fig. 26) you see several valleys. Rain falls into each of these, some of it sinking into the soil and some running off down the slopes. Into which valley will the water flow that falls on the top of the ridge?

When it rains upon the roof of a house (Fig. 27), the water is divided along the highest part, some flowing down one side, some down the other. The same thing happens when water falls on the land. Because the water

parts, or divides, at the highest place between two valleys, this place is called a *divide* or *water-parting*, or sometimes a *watershed.* The dotted lines in the picture (Fig. 26) show some divides. How irregular the lines are!

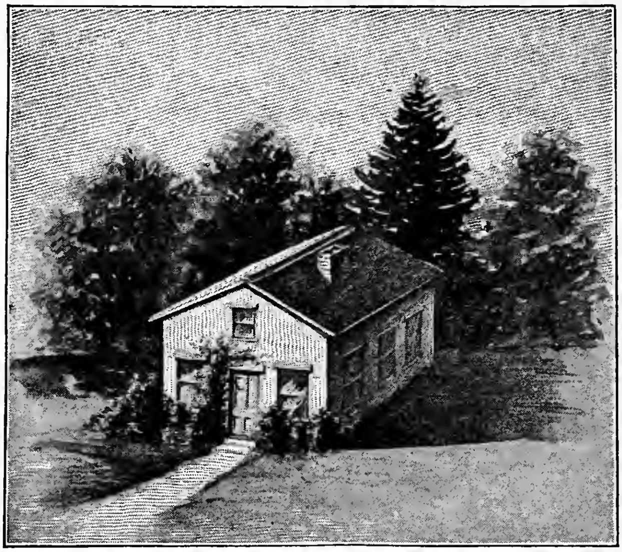

Fig. 27.
A house roof, to show that the water is divided along the highest part.

A divide sometimes stands out sharply, as on the roof of a house; but in many places it is difficult to find, for the land there may appear to be flat. Can you point out such a place in Fig. 26?

If you wish to know how wide one of these valleys is, where would you begin to measure? Would it not be from the divide on one side to the divide directly across on the other side? Of course it would, for the divides form the boundaries of the valley (Fig. 28).

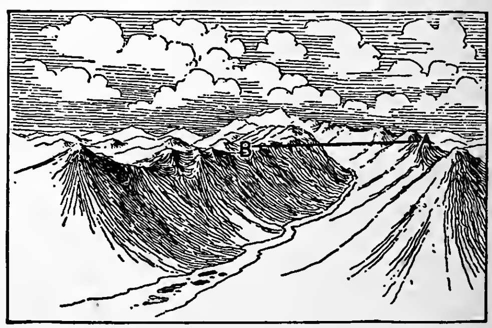

Fig. 28.
The line *A–B* shows the width of this valley. Observe that the valley is much wider than the stream.

A divide or watershed is the highest ground separating two valleys.

While the valleys that one usually sees are both narrow and short, there are some so long and wide that one could not travel their whole length or width, even if he were to spend all day and all night upon a fast train (Fig. 29). In our own country there is such a one, called the Mississippi Valley, which is over three thousand miles long and many hundred miles wide.

FIG. 29.

Picture of a river winding through a broad and very long valley.

When valleys are as large as this, their slopes must be very gentle. On that account many people who live in the Mississippi Valley scarcely know that they are in a valley. The river flows through the lowest part, and the homes of these people may be so far away that they have never seen it. All about them the land appears so level that it does not seem to form a part of a slope. It is

therefore called a *plain*. But when rain falls there, it immediately flows toward the river, thus proving that the plain is a part of the great Mississippi Valley slopes.

Such an immense valley was not cut out by running water. You have learned that hills are made in that way, but that mountains are formed by the rising of great masses of rock. Some of the great valleys, like the Mississippi, have also been made by changes in the level of the land. But even the valleys that have been formed in this way have generally been greatly changed by the water that has run through them.

Some great valleys have been formed by the rising or sinking of the land.

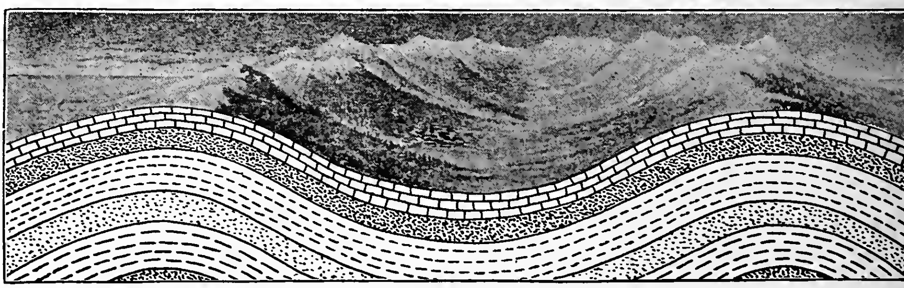

FIG. 30.

A valley sliced through to illustrate how valleys may be formed by the folding of the rock layers.

People generally choose the valleys for their homes. Even among high mountains, where it is impossible to live on the steep and cold sides, they often dwell in the bottom of the valleys. Here they are surrounded by lofty peaks which appear to shut them in almost entirely (Fig. 31).

Hills are often too cool, or else have too shallow a soil for farming. The rains have washed the dirt down the steep slopes into the lower part of the valleys, making a deep and fertile soil there. In the valleys, therefore, the

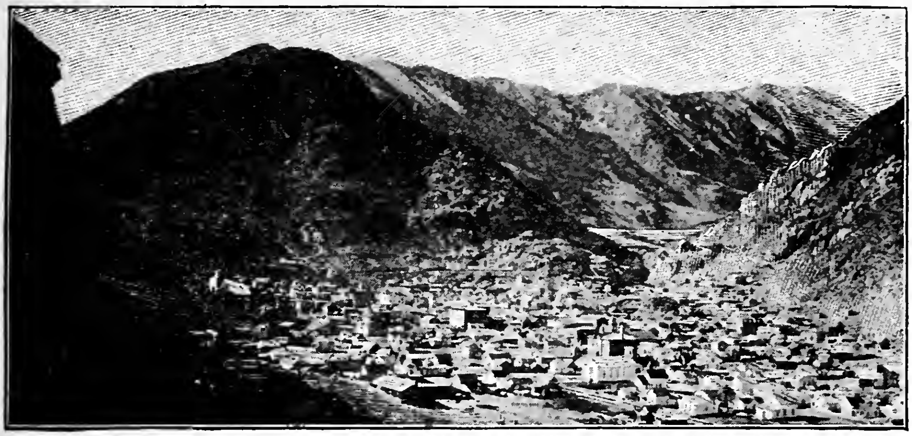

FIG. 31.
A city near some mines in a valley among the Rocky Mountains.

best farms are found, with their great fields of corn, oats, wheat, and grass. Here, also, cattle and horses are raised (Fig. 32), many large cities have sprung up, and railways have been built.

FIG. 32.
A herd of cattle grazing on the clover that is growing in the deep, rich soil in a valley bottom.

Most of the land is really made up of slopes, and we are living upon them. It may not seem that your home is upon one, but it probably is. Your house may even be upon a hilltop, and yet you may be living in a broad valley.

Most people live in some part of a valley.

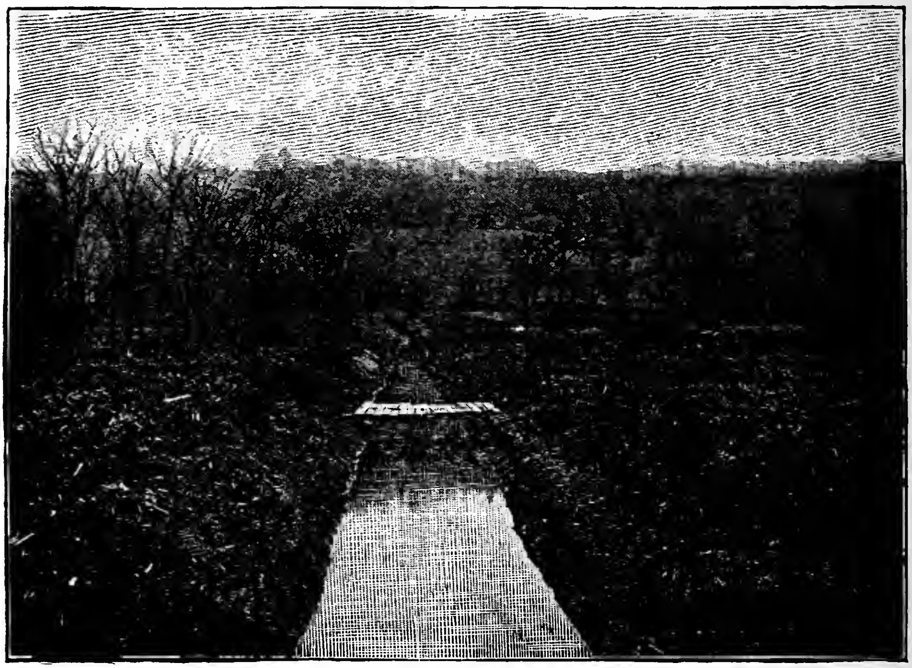

Fig. 33.
A ditch dug to drain a swamp.

The soil is all the more valuable because of the slopes of valleys. Were it not for them the water, after a heavy rain, would stand in a thin sheet upon the ground. But where there are slopes down which the water can freely run, it quickly flows off and does not drown the crops or make the region unhealthful for man and animals.

The great importance of this matter is shown when farmers buy land. One of the first things that they inquire about is *drainage*, that is the slopes, which allow the water to run off quickly.

If the water does not freely flow away, they even dig ditches in order to carry it off (Fig. 33). Sometimes these ditches are left open, as in the picture; but, more often, tiles are placed in the bottom, forming a kind of pipe, and then the earth is thrown back again. The water finds its way into the pipes, through small openings that are left for this purpose, and flows away. Good drainage is so important that men are often willing to incur great expense in order to secure it.

In some places the land is so nearly level that the standing water produces *swamps*. There are thousands of swamps in this country, and great sums of money are spent in digging ditches to drain them. This makes the swamp dry; and since the soil in such places is very fertile, a great deal of land that was once of little value is now changed to rich farms.

The slopes of valleys are valuable for drainage.

Valleys have had a great influence upon the roads of a country. For instance, in going across mountains men generally follow a valley, going higher and higher until they come to what is called a *mountain pass* (Fig. 34), which is nothing more than a valley between mountain peaks. After crossing this, they go down another valley on the other side of the mountain.

Railroads also cross mountains through the valleys and over the lower passes; they wind in and out, often making sharp curves in order to avoid cutting directly through the rock.

Even in hilly regions it is usually easier to get from one place to another by travelling in the valleys. In the

lower parts, near the streams, the land is most nearly level; but as soon as one attempts to go directly across the country, the roads become rough and hilly.

On that account, when white men first came to this country, and settled among the hills and mountains, they built their roads in the valleys, often quite near the streams. Men do the same thing still.

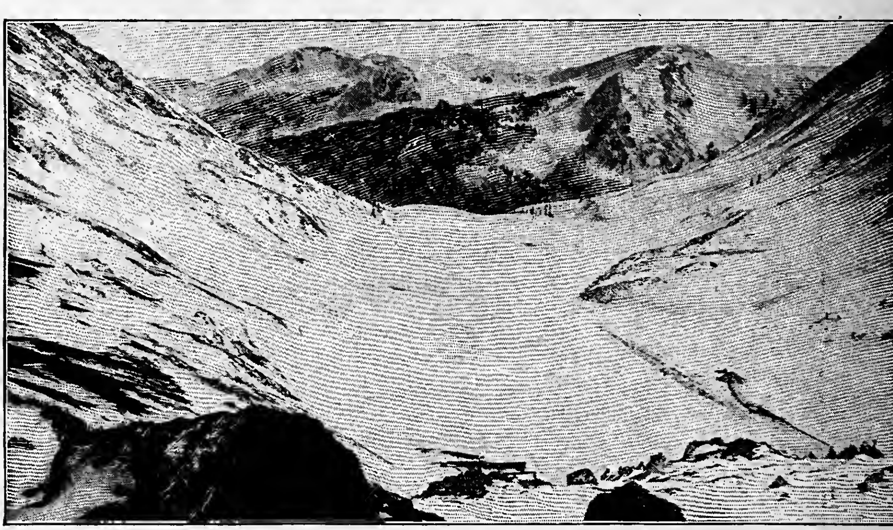

FIG. 34.

A mountain pass among the lofty Rocky Mountains of Colorado. Point to it.

Where the country is more level, as upon a plain, it is not so difficult to travel directly forward; but even in such places both the wagon roads and the railways are often built round a small hill rather than over it.

The location of wagon roads and railways depends on the valleys.

We have seen that hills and mountains afford many beautiful views. But it is not necessary to go to the mountains to see fine views. You may see them in almost any valley or plain. Even a field of green

green grass, such as may be seen in city parks, and in the country, is beautiful. This is particularly true in the early spring, after the long, cold winter.

Fig. 35.
A beautiful tree-lined roadway in a small town.

Those who live in small towns or cities may find streets where the trees have grown so tall that they droop and meet overhead (Fig. 35). As one looks down such a street, he can scarcely help exclaiming, "What a magnificent archway!"

In the country, also, there are many beautiful sights, such as the variously colored fields, the waving grain, the graceful trees, and the shady roads.

Fig. 36.
A scene in a city park after a heavy fall of damp snow.

The views change from time to time. They are not the same at noon as in the late afternoon when the sun is casting long shadows. In the spring the plants are fresh and bright; in the autumn they are prettily colored; in the winter

the damp snow clings to the trees, bushes, fences, and houses until everything is robed in white (Fig. 36). Again, the rain freezes to the trees, and when the sun appears, everything sparkles in the bright light as if it were covered with a thousand jewels.

It is not necessary, then, to travel far in order to find beautiful views; they are to be found everywhere, not only among the mountains, but on the hills, in the valleys, in the country, and in the city.

The hills, mountains, and valleys are very beautiful.

Review Questions. — (1) What makes the little valleys? (2) Tell why they must change from year to year. (3) Describe some of those that you have crossed on the railway. (4) How many slopes are necessary to make a valley? (5) What is a divide? (6) Tell how large some of the largest valleys may be. (7) How have these very large valleys been formed? (8) What is a plain?

(9) In what parts of mountains do most people live? Why? (10) What is meant by drainage? (11) How do farmers sometimes provide drainage? (12) What is a swamp? (13) Why do roads and railways among the mountains follow the valleys? (14) What is a mountain pass? (15) Where is the most level land usually found? (16) What fields or yards near you are beautiful? (17) Are there any walks or drives that you greatly enjoy? (18) How do the views change from time to time?

Suggestions. — (1) Find a tiny valley and watch to see if it is changed in any way by a heavy rain. (2) Find a still larger valley in your neighborhood. (3) Find the divide on each side of it. (4) Show that streets and roads are so made that they have a watershed. (5) Make some valleys in clay or sand and show the divides. (6) Where is the largest valley in your neighborhood? (7) Is your home in one of the very large valleys, or in a small one? (8) Show by a drawing like Fig. 30 how the largest valleys have been made. (9) Can you show it in any other way? (10) Why should swamp land that has been drained raise uncommonly good crops? (11) Do you know of any roads or railways that follow valleys and wind about the hills? Tell about them. (12) Find some beautiful views in your neighborhood. (13) Make a collection of pictures of valleys. (14) Write a story telling how valleys have been formed.

For References, see page 109.

V. RIVERS

Every heavy rain causes the water to collect, here and there, and flow down the slopes. At first only tiny rills are formed; but these unite to form the little streams and brooks.

In some places a brook is narrow and deep, in others broad and shallow; here it flows swiftly and there slowly. Place a chip or a boat in such a brook, and it floats quietly in some places, and then, coming to a *rapid*, it is whirled along swiftly and perhaps upset (Fig. 37). Or it may float to a *waterfall*, where the water tumbles down from the top of a ledge, and then it is surely overturned (Fig. 38).

Fig. 37.

A noisy brook in the Adirondacks of New York, tumbling over its rocky bed.

There are large rivers in the world much like these little brooks, the main difference being in their size. But even such rivers are generally small at their beginning or *source*. Some of the largest have their sources far up in the mountains, where they are so small that a person can easily step across them.

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FIG. 38.

A mountain torrent leaping over the ledges in rapids and waterfalls. Point to one of the falls. Find others in the other pictures of the book.

The water of these rivers may come from the melting snows; and, as it dashes along, beating itself into foam by striking against the rocks, it is joined by other streams like itself. Often the water must rush round or leap over large boulders which lie in its path; and often it falls directly downward for many feet with a great roar (Fig. 75).

Great rivers at their source are usually no larger than a brook.

The water of a mountain stream seems to be quite helpless, with the great, hard rocks all about it; but it never gives up its struggle with them. Rocky cliffs may reach far up into the sky on either side, and the slopes may be so steep that loose pieces of stone often fall into the water. But the torrent dashes these against one another, and grinds them against its rocky bed, until they are worn into pebbles. These pebbles are borne down stream and are slowly ground up into grains of sand and bits of clay.

If we should travel down such a stream, starting near its source among the wild mountains, we should find it constantly changing. In the first place, it gradually grows larger, because other streams, called *branches* or *tributaries*, enter it (Fig. 39). The *banks* become lower and the river grows broader and deeper. In places there may still be rapids and falls, but the country on either side is not

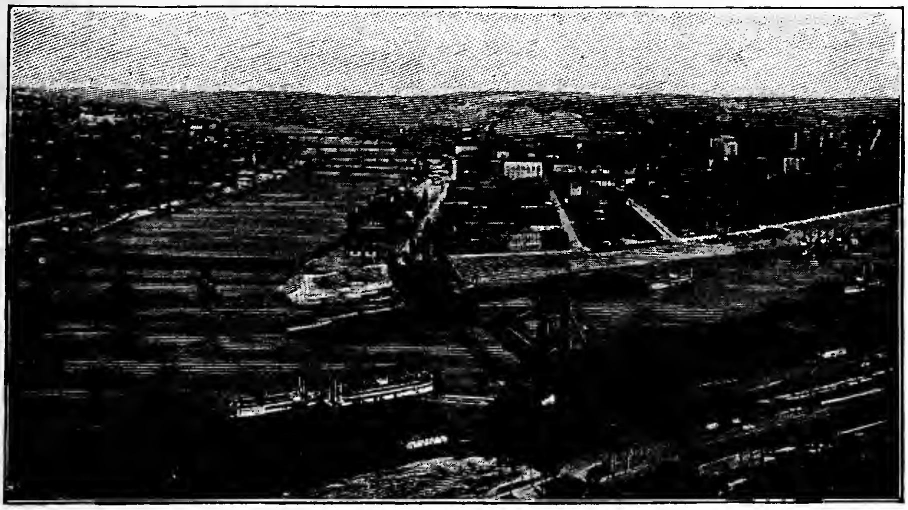


Fig. 39.

Two streams, the Allegheny and Monongahela, uniting at the great city of Pittsburg in Pennsylvania.

so steep and rocky as it was among the mountains. Now, houses, farms, and men are seen, and horses and cattle are grazing in the fields near the banks (Fig. 40).

At first, the slope of the *stream bed* was so great that the river hurried along faster than you could run. Now the water no longer flows rapidly enough to drag boulders or even pebbles; but it can still carry the sand and mud brought by the rain from the soil of the hillsides.

It has now been many days since this water left the

FIG. 40.
The Connecticut River in Massachusetts, flowing through a splendid farming country.

mountains. The river has become so wide that a long bridge is needed to cross it (Fig. 41), and so deep that one cannot touch its bed even with a long pole.

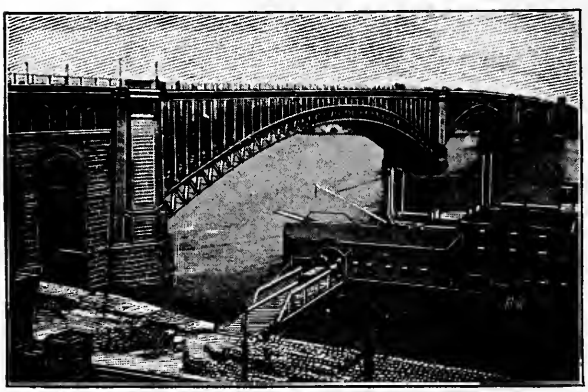


FIG. 41.
The long bridge across the Mississippi River at St. Louis.

At last, perhaps weeks after it started, the water approaches the ocean; and now the downward slope of the river bed is so gentle that the *current* cannot drag even grains of sand; but it still carries fine bits of rock-mud

with it. These bits may be so tiny that if you were to place some of the muddy water in a glass, it would take hours for all of them to settle and leave the water clear. When the river enters the quiet waters of the ocean, even this mud, or *sediment*, settles.

We have followed the river from the source to the *mouth*, where it empties its waters into the great ocean. At first it was a little stream, but by the addition of water from many tributaries, it has grown larger and larger, until at its mouth it may be more than a mile in width.

A great river is broad and deep at its mouth, and its current is very slow; but it carries sediment even to the ocean.

We have been describing a large river that had its source in the mountains; but others are much smaller, and many do not start in the mountains. Some empty their water into other rivers, being tributaries, and others enter lakes rather than the sea. They may also have low, soft banks instead of high, rocky ones, and there may be neither rapids nor falls. But no matter where their sources and mouths may be, or what other differences may exist, they are, in many ways, much like this river.

Fig. 42.

A pebbly brook bed which is filled with water when the rain falls or the snow melts, but is often dry in summer.

Where does so much water come from? Taken up from the ocean, it falls from the sky in the form of rain

or snow. But we all know that small streams dry up and disappear soon after a rain. Even large brooks may become quite dry in summer (Fig. 42). Why, then, do not great rivers also dry up?

One reason is that many rivers have a constant supply at their source. That this is true of a stream starting in a high mountain is clear, because we have seen (p. 26) that the snow in such places never entirely melts away. It is also true of streams that have their sources in lakes and swamps.

Then, again, not all of the rain-water flows off, but some sinks down into the ground. There is a great deal of water in the ground, and it is this which men find when they dig wells. This underground water trickles through the soil, and through crevices in the rocks, often bubbling forth as a *spring*, weeks after it has fallen as rain somewhere else. Most large rivers are supplied with water from hundreds and even thousands of such springs.

It is to be remembered, too, that a great river, with its many tributaries, flows through a very large tract of country, so that when it is not raining in one part, the rain may be falling in another. Thus, while one tributary carries little water, heavy rain may keep others full, and this flows into the main stream, preventing it from drying up.

If a heavy rain falls, or if the snow melts rapidly, so much water may flow into a river that it rises and overflows its banks (Fig. 43). Those who live near such streams are in danger of being drowned by the floods, and in some places men have built banks of earth, called *levees*, to keep the water from overflowing the towns and farms.

The supply of river water comes from rain or melting snow, from lakes and swamps, and from underground.

Every one has seen muddy water flowing in gutters, or in rills on the hillsides. Great quantities of soil are washed away in this manner, as has been shown (p. 11). But what becomes of it all?

If you have seen a sidewalk or a field flooded with water, you perhaps remember that when the flood disappeared, a thin layer of fine mud was left. This mud was carried along by the current until it reached a place where the water stood almost still, then it slowly settled. The same thing will happen if some muddy water is allowed to stand in a glass for a time. Try it.

In much the same way, when there is a river flood (Fig. 43), the water spreads out on either side of the river in a great, thin sheet, flowing slowly along and depositing a thin layer of mud. Each flood adds a layer, making the land higher, until, after many years, it is lifted considerably above the usual level of the river. Such land is generally a level plain; and since it is made by river floods, it is called a *flood-plain.*

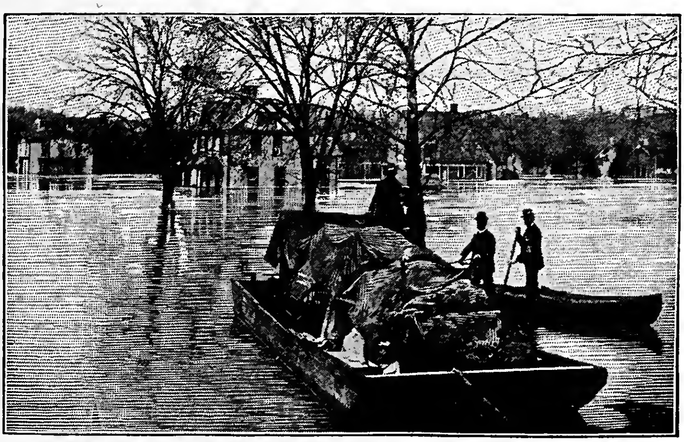


Fig. 43.

Photograph of a river flood on the Ohio, which has forced the people to move out of their homes. Tell what you see in this picture.

Many pieces of land have been made in this manner, and you have perhaps seen some of them. Near the banks of streams the valley is often flat, and the hillsides that bound the bottom of the valley begin to rise at a considerable distance from the water (Fig. 44). This level land is usually a flood-plain. Near small streams such plains are gen-

erally narrow; but in the Mississippi and other valleys the flood-plains are many miles in width. Farmers like this soil because it is very fertile.

Some of the sediment carried by rivers forms flood-plains.

FIG. 44.
A small flood-plain between steeply sloping valley sides.

Much of the sediment is carried on until it reaches a lake or the ocean. Here, opposite the river mouth, the water is generally quiet, so that the mud sinks to the bottom. At first only enough sediment is collected to form low, swampy land; but this is gradually lifted higher and higher, by layers of mud from each flood, until it becomes high enough to make dry land.

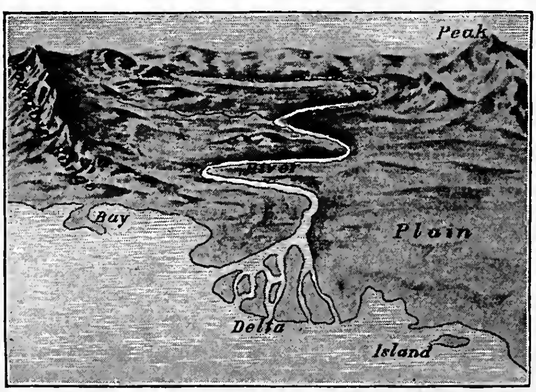


FIG. 45.
This picture shows a river delta. What else do you see in the picture?

These plains at the mouths of rivers form

what are called *deltas* (Fig. 45). Many streams have such wide deltas that one cannot see across them, most of the sediment having come from fields, hills, and mountains, perhaps hundreds of miles away. The surface of the delta is a plain, because it cannot be built any higher than the floods themselves have reached.

From year to year more sediment is brought down, and the land is built further and further into the water, so that deltas are constantly growing. The slope of the river bed is usually so gentle that all of the water cannot flow out in a single channel. For this reason it enters the sea through several arms, cutting the delta into several parts.

Some of the sediment carried by rivers builds deltas at their mouths.

A river entering the sea may receive water brought by hundreds of tributaries. Thus the rain that falls in places even hundreds of miles apart may at last be brought together in a single main stream. Such a main stream with all of its tributaries is called a *river system* (Fig. 46). For instance, we speak of the Mississippi River system, meaning the Mississippi and its many tributaries.

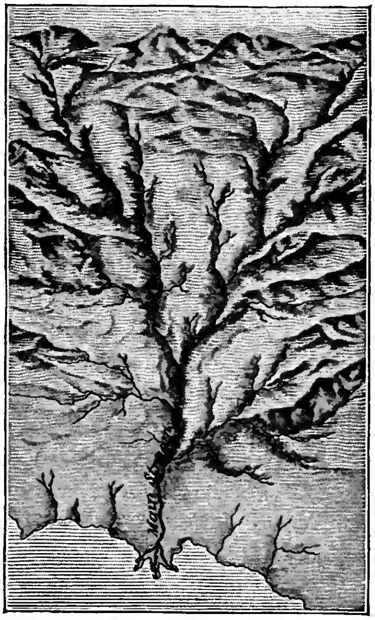


FIG. 46.

Picture of a river system and river basin. Point to some of the tributaries; to their source; to the mouth; to the delta.

All the country which is drained by a single main stream is called a *river basin.* Thus all the land drained by the Mississippi River is included in the Mississippi basin.

One should not think of this as a true basin. A real basin, as a

wash basin, has a rim extending all around it. The rim of a river basin is the divide; but there is no divide, or rim, near the mouth of a river, since the water runs out into the sea. If it were a true basin, with a rim all around it, the water would collect and form a lake.

All the land whose waters are drained by a single river is called a river basin, and all these streams together form a river system.

Some ways have already been suggested in which rivers are of much use. They build flood-plains and deltas, thus making some of the most fertile land in the world. Rivers also furnish water to plants, animals, and man.

On page 6 it was shown that plants sometimes wither during hot weather, because the soil is dry. But near rivers the soil is usually kept so moist that plants grow well even in dry weather.

There are some places in the world where there is not enough rain for crops to grow. The people in such regions sometimes lead the water out of the rivers into ditches, through which it flows for long distances. Then it is spread out over the thirsty soil, so that plants can thrive. This is called *irrigation*, and in some places no crops can be raised without it.

Many animals and people depend on rivers for all the water they use. Even whole cities obtain their drinking water solely from rivers.

Streams not only bring water that is needed, but they also carry away that which is not wanted. A river is really a great ditch for draining the land, so that whenever the snow melts rapidly, or a heavy rain falls, the rivers quickly remove the water. They also carry off the filthy water, or sewage, of many towns and cities.

Rivers supply water that is needed, and remove that which is not wanted.

The water of rivers is also used for turning wheels to help make many articles, such as cloth and flour.

You have perhaps noticed how windmills work (Fig. 68).

The *wind* blows the large wheel round and round, and it is so connected with other wheels that it can pump water, or turn a saw for sawing wood, or grind corn. Likewise *steam* is used to turn the wheels of a railway engine, so that it drags the heavy cars along.

River water is made to do work in much the same manner. Where there is a swift current, or where there are

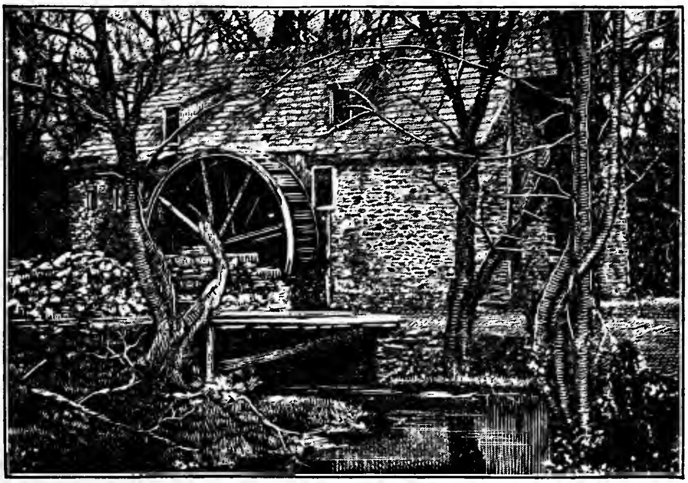


Fig. 47.

A picture of an old mill and old-fashioned wheel. Much smaller wheels are now used, and they cannot usually be seen.

falls, as the Niagara Falls (Fig. 135), it is often easy to run some of the water off to one side through a ditch or pipe. The water, racing rapidly along, strikes a wheel (Fig. 47) and makes it whirl round. This wheel, being connected with others, causes them to turn also, much as one wheel in a clock causes others to revolve.

Thus machinery is set in motion by which logs are sawed into lumber, grain is ground into flour, cotton is made into cloth, and many other kinds of work are done.

The water that furnishes the power to turn the wheels is called the *water-power*, and the buildings in which such manufacturing is carried on are called *factories* or *mills.*

In many places the river water does not flow fast enough to strike a wheel with much force; water-power is found mainly in rivers with swift currents, and especially near rapids and falls. Here mills have been built, and then great cities have often sprung up (Fig. 75, p. 85).

Rivers also supply water-power for manufacturing.

There is still another way in which rivers are extremely valuable. It has always been difficult to find a convenient means for carrying goods from one place to another. In some places there are no roads; and even where there are, they are often hilly, rough, and muddy.

Yet most of the articles that we use every day, like sugar, flour, oil, meat, coal, lumber, and clothing, have been carried long distances, sometimes thousands of miles. Even if the roads were excellent, it would take a great deal of time, and cost much money, to bring these things in wagons. To carry them by railway takes less time, but is expensive.

A broad, deep river is really one of the finest roads in the world. To be sure, no wagons or cars can be drawn over it, but boats move there with ease. A river boat can carry as much as scores of wagons or cars (Fig. 48), and many may be going and coming at the same time, so that a large river is equal to several railroads; it costs little, too, to keep it in repair.

For these reasons carrying goods by boat upon rivers, or *river navigation*, is a very important business. Indeed, it is so important that in many places broad ditches, called

canals, have been cut in the soil and rock in order to carry goods by boat.

Before the railways were built, — which is no longer ago than when your grandfathers were boys, — boats were used for carrying all sorts of articles from place to place. Even to-day, when there are so many good wagon roads and railways, it is cheaper to carry crops and other products on boats than in cars, and this is often done.

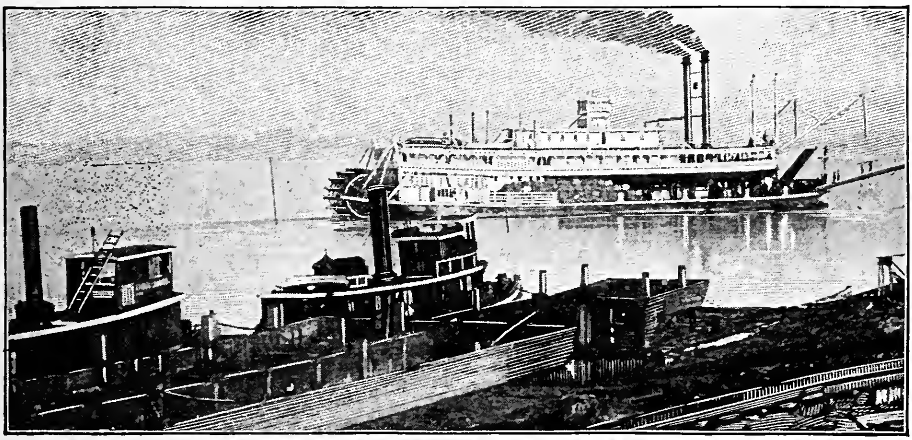


FIG. 48.

A view across the broad Mississippi at New Orleans. The other bank is seen dimly in the distance. A loaded river boat is just coming in, and others are tied up to the levee.

We see, then, why many people have preferred to build their homes near rivers. A farmer prefers to live near a good wagon road, or near the railway station, so that he may easily send his crops away; and, for the same reason, people have always liked to live near a river, which is a good road or *waterway*. It is partly on this account that many of the large cities of the world stand on the banks of large rivers. Do you know of any such cities?

Rivers are also of value for navigation.

Review Questions.—(1) Describe a stream that you have seen. (2) What are rapids and falls? (3) Describe a small stream in the mountains. (4) What does it do with the rocks in its way? (5) What are tributaries? (6) Does the current grow more or less swift as one goes further down stream? (7) How does the country change in appearance? (8) What becomes of the pebbles? Why? (9) What is meant by the source of a river? By its mouth? (10) Where do rivers obtain their water? (11) What is a spring? (12) What effect has a heavy rain upon a stream? (13) Why do not large rivers dry up in summer? (14) Why does not sediment sink where the current is swift? (15) What is a flood-plain? Why is it level? (16) Explain how a delta is made. (17) What is a river basin? (18) A river system? (19) Why do plants grow well on the banks of a river? (20) What is irrigation? (21) How are rivers useful for drainage? (22) What is water-power? (23) In what ways is a river a fine road? (24) Give some of the reasons why many cities have sprung up near great rivers.

Suggestions.—(1) After a heavy rain, follow a small stream from its source to its mouth. (2) Throw a chip into the water, and follow it as far as you can. (3) Why are the rocks in river beds usually so smooth and round? (4) If there is a brook or river near you, examine its banks. Is it a tributary of another stream? (5) How deep and how wide is it? (6) Trace a brook to its source, if possible. Find several tributaries. (7) What large river is nearest your home? What are its largest tributaries? (8) What is meant by "up a river"? By "down a river"? By right bank? By left bank? By river channel? By river bed? (9) Find a spring. Why is its water cool? (10) Watch a well that is being dug, to see if underground water is found. (11) Find a flood-plain along the side of a stream. (12) Find a delta. (13) Do you know of a city that gets its water from a river? (14) Make a small water-wheel, and arrange for a stream of water to turn it round. (15) Visit a mill that is run by water-power. (16) Find out more about canals. (17) Make a collection of pictures of rivers, and notice as many things as you can about them. (18) Find some poems describing brooks and rivers. (19) Write a story of a journey from the source to the mouth of a river.

For References, see page 109.

VI. PONDS AND LAKES

Rivers supply towns and cities with water, and also turn the wheels of factories; but some streams become so low in summer that they lack water for these purposes. To prevent this difficulty men often build dams of wood, earth, or stone across the rivers, and in this way collect sufficient water to make ponds (Fig. 49). When the rivers are high, these ponds are filled, and enough water gathers to last through the dry season.

Fig. 49.
A dam of dirt, built in order to form a pond or reservoir.

Probably you have seen such a pond as this. Or you yourself may have made small ponds by building dams of mud or leaves across brooks and gutters (Fig. 50).

Lakes may be made in a similar manner, for they are like ponds, only larger. Sometimes they are several hundred miles in length, and perhaps one hundred miles in width. Some of the largest in the world, the Great Lakes in the northern United States, were made by dams formed ages ago across parts of the great St. Lawrence River system.

Most ponds and lakes have been made in much the same way. That is, the water has gathered behind dams across streams.

But in most cases these dams have not been built by men. Beavers have made a few of them. There used to be a great many of these little animals in this country, and some are still left. Since they prefer quiet, shallow ponds in which to live, they gnaw down trees and build dams with the logs; then they build their homes in the water thus collected.

In other places, where the sides of a valley are steep, great masses of rock and earth have sometimes fallen, in the form of avalanches, and blocked or dammed the streams.

Fig. 50.

A boy building a dam to form a pond in the gutter.

Also it was stated (p. 19) that the earth has been warped or bent upward in some places, forming low ridges, or even lofty mountain ranges. In this way the ground has sometimes slowly risen across river valleys, making high dams; in such cases large lakes have been formed.

There are many other ways in which dams have been built, especially by means of glaciers, which you will study about later.

Most ponds and lakes have been formed by dams across valleys.

Since a lake is generally a part of a stream, it is evident that water must flow into it. The river that flows into a lake is called the *inlet*, and that which flows out is called the *outlet*. There are also many streams entering from the sides. Each of these brings sediment, which settles in the lake, slowly filling it. At first deltas are built opposite to the stream mouths; then, in time, the whole lake is filled and changed to a swamp. Many a swamp is really the last stage in the life of a lake.

The surface of a lake appears to be level; but one part is really slightly higher than the other, otherwise the water would not flow out of it. The higher part of the lake, near the inlet, is called the *head of the lake*, the lower part, near the outlet, the *foot of the lake*. It is correct, then, to speak of going up or down a lake, just as we speak of going up or down a river.

Some lakes have no outlets, because there is so little water that the basin cannot fill up and overflow. This has a very peculiar effect upon the water, for in time it becomes salt. Probably you have heard of the Dead Sea and the Great Salt Lake of Utah. These are salt lakes of this kind, and no one would drink their water, even if he were dying of thirst.

But why do such lakes become salt? There is some salt in all water, even in that which we drink, although so little that we do not notice it. When water flows into a lake, the salt is carried with it. If there is no outlet, the salt can go no further; but each day some of the water is changed to vapor and carried away in the air. As the bits of salt cannot go off in this way, they remain, and increase in number, until, in time, the water becomes so salt that we have a *salt lake*.

Most lakes have inlets and outlets; but some, having no outlets, become salt.

The land at the margin of a river is called the *bank*, but that along the margin of a lake is called the *shore*.

Fig. 51.

A sandy beach on a lake shore.

Sometimes the lake shore is low and wet, being overgrown with swamp plants. Again, it is pleasant to walk upon, being made of sand and pebbles brought there by the waves. This kind of shore is called a *beach* (Fig. 51).

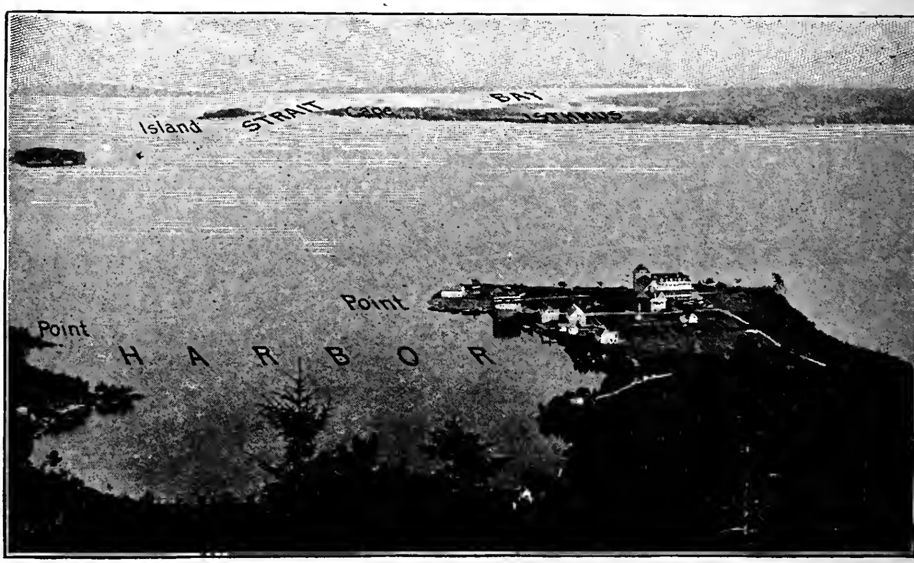


Fig. 52.

A view on Moosehead Lake in Maine. Learn what each of the names means.

Many lake shores are regular, but many more are irregular. In some places points of land, called *headlands*, extend into the water (Fig. 52). If small, these are called *points* or *capes;* if large, *peninsulas.* A narrow neck of land joining two larger pieces is an *isthmus.* Bodies of land entirely surrounded by water are known as *islands.*

The water that is partly shut in between two headlands is called a *bay.* When a bay has deep water, and is so nearly surrounded by land that vessels can enter it and be protected from the wind and waves, it is called a *harbor.* A narrow strip of water connecting two larger bodies of water is known as a *strait.*

Fig. 53.

How many of the features just mentioned can you find in this picture? Find some also on Fig. 60.

When the water gathers behind a dam to form a lake, it enters many valleys, forming bays and harbors, with capes, and perhaps islands between. This is the chief reason for the irregular shores of many lakes. If you will make a little valley in clay, with two or three tributaries entering, then put a dam across it and fill it with water, you will see just how this is done.

The shores of lakes are often irregular, producing bodies of land and water of many shapes.

Ponds and lakes are useful in many of the same ways as rivers. They help to keep the ground moist; they furnish water to cities, and they supply water to turn the wheels of factories. Besides this, many valuable fish are caught in lakes, and much ice is cut from their surface.

Again, like rivers, lakes are important waterways. Upon large lakes, like the Great Lakes, hundreds of vessels are going and coming, carrying men, grain, coal, lumber, and countless other things. On this account many people have settled on the shores of large lakes; and, as a result, many towns and cities have been built there. Do you know of any?

The shores of lakes are often very beautiful, and many persons go to them in summer to hunt, fish, and canoe. There are hotels there, too (Fig. 52), and some lakes are important summer resorts.

Lakes supply drinking water, water-power, fish, and ice. They are also useful for navigation and for summer resorts.

How are vessels loaded with goods? And again, how can these cargoes be unloaded? Wagons may be driven beside a railway car, and be filled or emptied speedily. But a large boat sinks down many feet into the water (Fig. 54), so that if it came near the shore, it might strike the bottom and be wrecked.

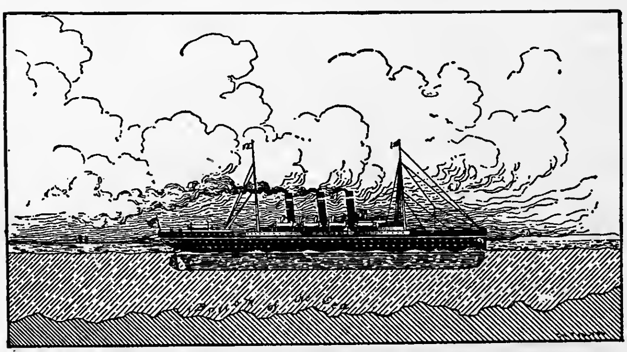


Fig. 54.
A picture to show how deep a vessel sinks in the water.

Fortunately, here and there along the lake shore, there are small bays with deep water. The opening is large enough for vessels to enter easily, but small enough to keep out the fierce waves. Here we have a fine *harbor* (Fig. 55).

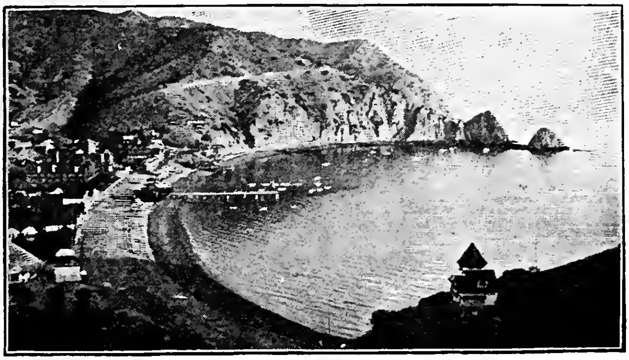


Fig. 55.
A small harbor on an island on the coast of California.

From the shores of the harbor men build piers of wood or stone, called *wharves.* These reach into the deeper water, where ships may be fastened or *moored* to them. Wagons can be driven on to the wharves, so that this forms a convenient and safe place for loading and unloading vessels. Such a harbor often determines the location of a city.

Large cities are sometimes found on parts of a lake shore where there are no such natural harbors. In that case harbors have to be *made,* even though it is expensive to do so. Walls of rock, or of posts driven deep into the ground, are built in such a way as nearly to inclose a body of water, very much as capes inclose the water of a natural harbor. Such a wall is called a *breakwater* (Fig. 56), because it breaks the force of the waves, and prevents them from entering the space behind.

When a harbor is not deep enough for vessels to enter, it is necessary to dig out the dirt and rock from the bottom. This is quite often done in the inlet and outlet streams at the ends of a lake.

Harbors are places where vessels find safety from storms and where cargoes are loaded and unloaded with ease.

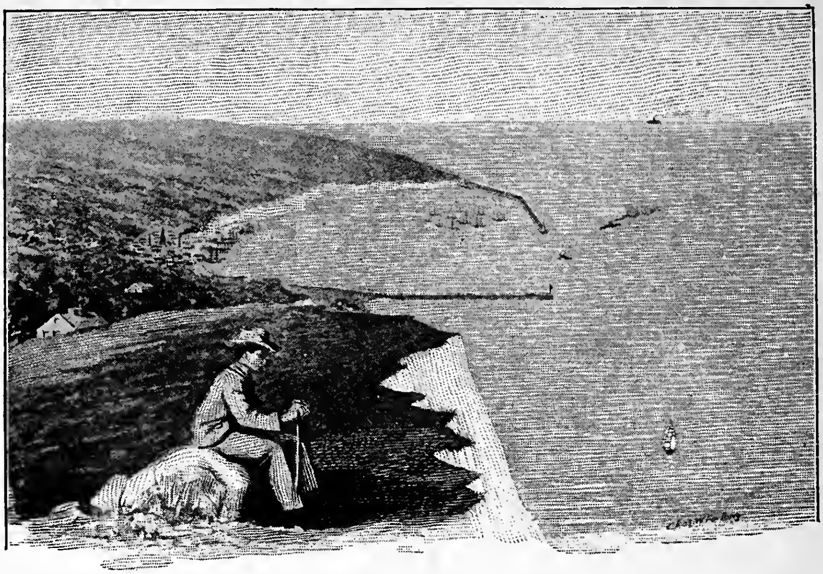


FIG. 56.
A breakwater built in a place where the coast has no natural harbor.

REVIEW QUESTIONS. — (1) Why are dams built in rivers? (2) Explain how ponds are made. (3) How do lakes differ from ponds? (4) How are lakes made? (5) Tell what you can about beaver dams. (6) In what other ways may lake dams be made? (7) What is the inlet of a lake? The outlet? The head? The foot? (8) How does it happen that some lakes have no outlet? (9) What about the water then? Why?

(10) What is meant by shore? By beach? (11) What do you understand by a *regular* lake shore? (12) Make a drawing of a cape; peninsula; isthmus; island; bay; strait. (13) Tell in words what each of these is. (14) What is the cause of these irregularities? (15) Mention a few uses of ponds and lakes. (16) What is a harbor? (17) Why must the water be deep? (18) How can a harbor protect ships from storms? (19) What is a wharf? (20) How are harbors often made? (21) What is a breakwater?

SUGGESTIONS. — (1) Build a dam in some small stream and note how rapidly the water collects. (2) Find out more about beavers. (3) Look for a pond or lake and examine the dam that caused it. (4) See if there are both an inlet and an outlet. (5) Walk up the

lake; walk down the lake. (6) Examine the shore and notice the different forms of land and water. (7) Find a small harbor. Would every bay make a good harbor? (8) Make a small, irregular hollow in clay and fill it with water to form capes, harbors, and islands. (9) Find some of these in the pictures and maps of this book.

(10) How do men get ice from a lake? (11) In what ways do men catch fish? What kinds of fish have you seen caught? (12) Find pictures of good harbors. Look for the wharves and the breakwater. (13) Build a breakwater to form a little harbor in a small stream or pond. (14) Find just how many feet some of our largest ships sink into the water.

(15) Walk toward the nearest large lake. What are some of its tributaries? Where is the inlet stream? The outlet? What are their names? (16) Name some cities that are on lake harbors. (17) Write a story telling what you would expect to see along a lake shore.

For References, see page 109.

VII. THE OCEAN

THE great rivers, starting as tiny brooks, grow into larger and still larger streams, until, after days and perhaps weeks, they mingle their waters in the ocean. No doubt much of the rain falling in your neighborhood finally reaches the sea in this way; and if you could float along upon it in a light boat, in time you too would reach

FIG. 57.

A view of the great ocean. Notice the sailing vessel in the distance on the right-hand side.

the ocean. How large is this body of water, and what are some other interesting facts about it?

We can see across most lakes, and can sail across even the largest in a day or two; but the ocean is far larger. One could sail upon it in the same direction for many days without coming to land (Fig. 57). It is so great that it surrounds all the land on which people live, and no matter in which direction you might travel, if you went far enough you would come to it.

If you were to start out to reach the ocean, the journey might last many days. It might be necessary to go up hills and across valleys, to pass around lakes, and possibly over great ranges of mountains. You would be surprised to find how much land there is, and how many farms, villages, towns, and cities there are.

But there is far more water than land. In fact, the water covers about three-fourths of the earth's surface and the land only one-fourth. If one were to travel entirely around the earth, he would probably spend much more than one-half of his time upon the ocean.

The ocean is so immense that the great rivers in all parts of the earth pour their water into it. Their mouths may be thousands of miles apart, yet the sea stretches far enough to reach them all.

The water of the ocean is too salt to drink; but river water is fresh. Since there are many thousands of rivers entering the sea, would you not expect that their water would make the ocean less salt? It does do so near the mouths of great rivers; but soon it becomes mixed and swallowed up in the salt water. This is another way of showing the size of the ocean, for all the river water that enters it is not enough to make it fresh.

The salt water of the ocean surrounds all the land.

Different parts of the ocean have different names. For instance, the *Atlantic* Ocean is the part lying between the United States and the land called Europe, where the English, German, and other peoples live. We buy many articles from these countries, such as woollen cloth, knives, oranges, and olives; and they likewise purchase other articles from us, such as wheat, cotton, and meat. The way to reach these people is to cross the Atlantic Ocean. The fastest steamers need five or six days for the voyage.

In all parts of the earth, the ocean is a great highway. It is so large that thousands of ships are travelling upon it in all directions,

carrying people, cattle, grain, fruit, iron, different kinds of machines, and many other things. Although there are so many ships, the ocean is so large that one ship may sail for days without seeing another.

Ocean navigation is therefore a great business, and many thousands of men are engaged in it. Most of the ships used are larger than the vessels upon lakes, and they sink deeper into the water (Fig. 58). Very large ones, when loaded, reach down about thirty feet below the surface.

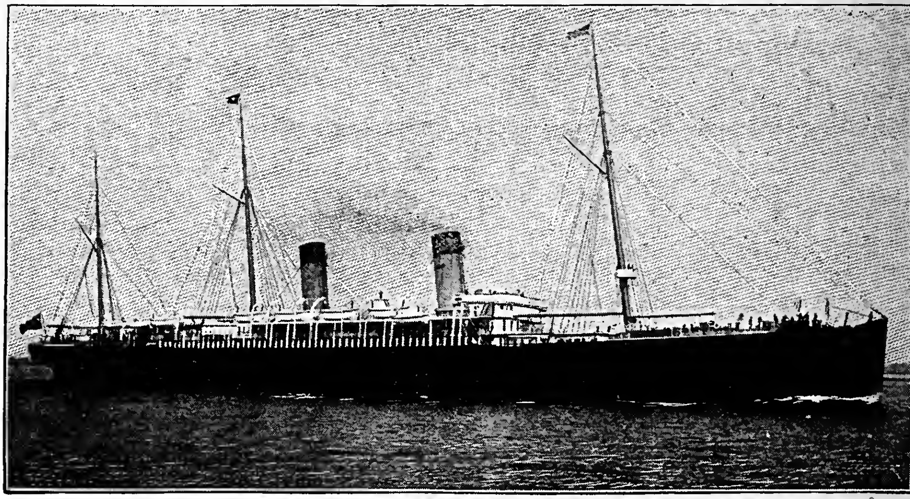


FIG. 58.
A large ocean steamer, one that sails between the United States and Europe. See how small the men appear.

Of course the ships meet with storms upon the ocean, as upon lakes. In fact, the ocean waves are at times so high that they sweep over and almost cover up the largest vessels (Fig. 59).

The coast of the ocean resembles the lake shore in having capes, peninsulas, islands, isthmuses, straits, and bays (Fig. 60). We have learned (pp. 19 and 32) that the land in places has been raised or lowered. When it is lowered near the seacoast, the water enters the valleys

and partly drowns the land, as it does in lakes (p. 57). This of course makes an irregular coast.

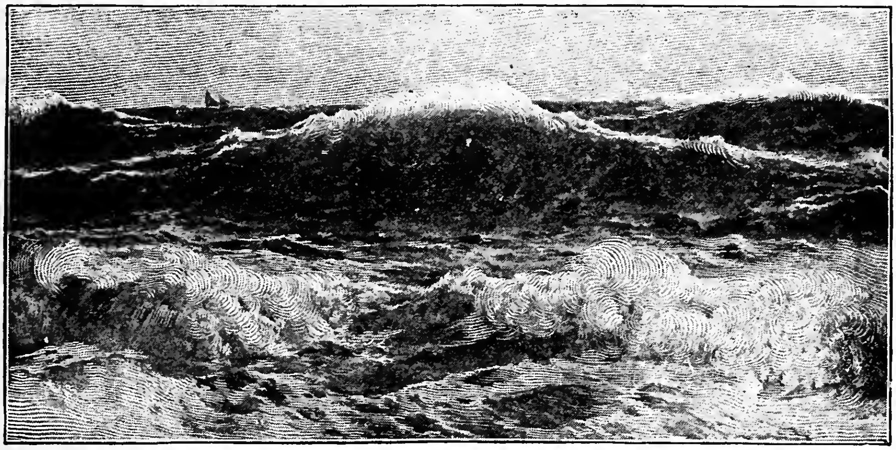


FIG. 59.

Ocean waves during a storm.

Naturally, on such an irregular coast there are harbors which large vessels enter, and in which they are safe from storms. For example, New York harbor is so broad and deep that hundreds of ships (Fig. 61) are found in it at all times, either loading or unloading their cargoes, or waiting for storms to pass.

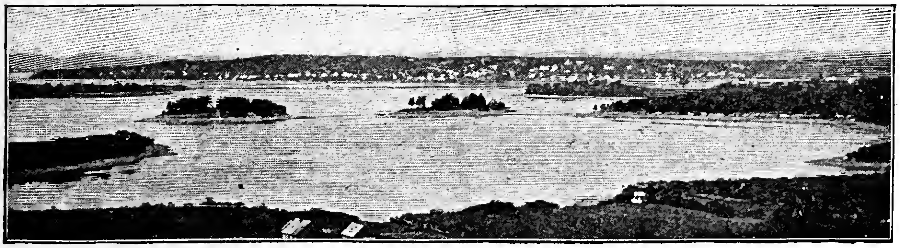


FIG. 60.

A picture of Castine harbor on the irregular coast of Maine. Here the land has been lowered so that the salt water of the ocean has entered the valleys, covering their bottoms, but leaving the hill-tops as islands, capes, etc.

Goods are brought to New York, not only from Europe, but also from China and Australia, and in fact, from all parts of the world. It is quite possible that the tea and coffee which are used on your table, and the bananas and pineapples which you have eaten, were brought over the ocean and unloaded in this harbor. If not, they were unloaded in some other fine harbor, such as Boston, San Francisco, Philadelphia, or Baltimore.

Since the ocean easily connects such harbors with all parts of the world, it is natural that great cities should

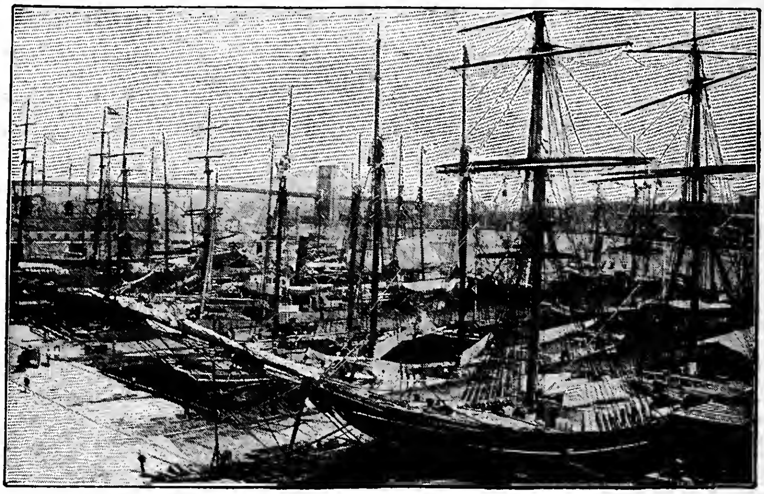


FIG. 61.

A view among the ships along the wharves of New York Harbor. The great Brooklyn Bridge is seen behind the masts.

spring up where the best ocean harbors are found. It is partly on this account that New York, Philadelphia, Boston, San Francisco, and Baltimore have grown so large.

Vessels come toward these *seaports* from all parts of the world; but it is often difficult to tell just where to enter the harbors, especially at night. Ships are in danger of going out of the way, and of running upon rocks, or *reefs*, in the shallow water near the coast (Fig. 62). On that account, tall lighthouses are built on many

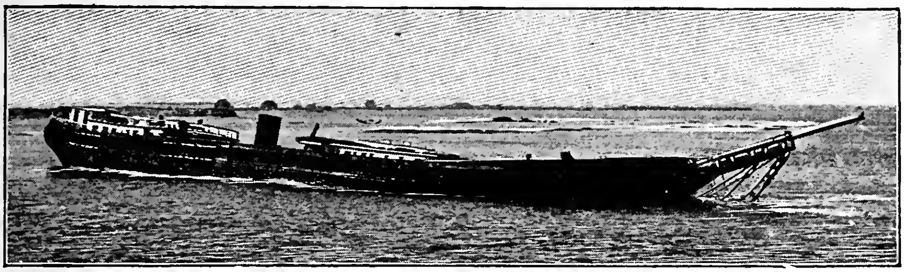


FIG. 62.

A vessel wrecked by running aground upon a shallow reef.

islands and capes, so that captains may know by their lights which way to go in order to enter the harbors (Fig. 63).

The ocean is a great waterway, connecting different parts of the world.

Not only are goods carried on vessels, but many men go out in them, often out of sight of land, in order to catch the fish which live in such great numbers in the sea. Instead of hooks and lines, long nets are often used, and in them so many fish are caught that

FIG. 63.

A lighthouse on a rocky point. A bright light is placed at the top of the tower so that it may be seen far away.

the vessel is loaded down with fish. No doubt some of the mackerel that you have eaten have been caught in this way. Picture 67, p. 73, shows a vessel that is used to catch ocean fish.

In summer the ocean shore is cooler than the land far away from the sea. This is because the air is cooled as it passes over the water. Many people therefore go to the seashore to avoid the hot weather, just as others go to the mountains. Here they spend day after day climbing about over the rocks or walking upon the clean,

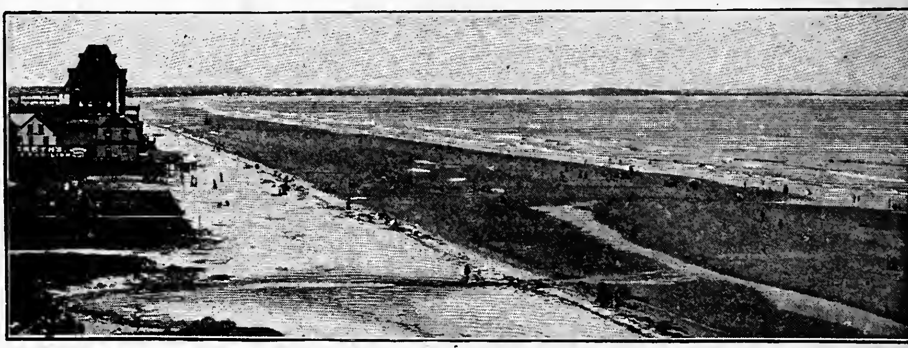


Fig. 64.

The sloping, sandy beach of a seaside resort. Notice the large number of summer visitors strolling over the cool, hard beach, or bathing in the shallow water.

sandy beach, breathing the fresh air, enjoying the beautiful scenery, and bathing in the cool salt water (Fig. 64).

On this account many houses, and even towns, have been built at those places along the seashore where people wish to spend their vacations. There are large hotels to accommodate the visitors; and in the summer these places are crowded; but very few people remain at the *summer resorts* during the winter.

There is another way in which the ocean is even more useful to man. It is the sea-water which supplies us

with moisture, so that there can be rain. If it were not for the great ocean, very little rain would fall. So every one is deeply indebted to the ocean, even though he may live thousands of miles from it. Soon you will learn (p. 74) how its water reaches us in the form of rain.

The seashore is a popular summer resort; the ocean water supplies food and makes rain possible.

Rivers, lakes, and the ocean present many beautiful views. You may have observed that in cities, where people plan for fine parks, they arrange, if possible, to have a lake or stream as part of the scenery. A body of water, even if but a brook, greatly improves a view.

Fig. 65.

A quaint New England bridge across a beautiful brook.

A brook is a beautiful object (Fig. 65). How pleasant to see its green banks, to listen to its rippling waters, and to watch its tiny rapids, whirlpools, and falls, as it travels onward to the ocean!

Rivers are not less attractive; like the brooks, their rushing waters seem to tell a story, and one loves to linger by them, to listen and to look. At times, when swollen by floods, they are wild and savage; again they are quiet, peaceful, and beautiful. They wind in and out among the steep and wooded hills; now they flow along noiselessly, then they rush over rapids and falls with a roar; here their banks are low and green, there they are high, steep, and rocky.

The lakes and the ocean are sparkling sheets of silvery water, often dotted here and there with white sails. Sometimes the color is green, again it is blue; and when the clouds hang over it, it is dark and

gloomy. There are beautiful sunrises and sunsets to watch; and one can see the storms come and go, with the waves dashing into the whitest of foam. In fact, the water, the sky, and the coast are always changing in appearance, so that the lake shore and the seashore are among the most attractive of places.

The land and the water together furnish many beautiful views.

Review Questions. — (1) What place does the water of brooks and rivers finally reach? (2) How much of the earth's surface is water? (3) What other facts show that the ocean is very large? (4) Tell about ocean navigation. (5) What is the cause for irregular ocean shores? (6) Tell what you can about New York harbor. (7) Why are large cities found on the fine ocean harbors? (8) Of what use are lighthouses? (9) Name some foods obtained from the ocean. (10) Why do many people go to the seashore in summer?

(11) Do you know of any park or meadow with a stream or lake in it? If so, describe it. (12) Did you ever enjoy watching the water? Where was it? (13) How does the surface of a lake or ocean change at different times?

Suggestions. —(1) In what direction would you go to reach the ocean? How far is it? (2) Find pictures of large harbors with ships in them. (3) Name several seaport cities. (4) Have some one tell you about a journey across the ocean. (5) Name as many articles as you can that come from over the ocean. (6) How does the captain of a vessel know in what direction he is going, after losing sight of land? (7) How are ships made to move through the water? (8) What use is made of whales? (9) Find out how fish are caught. (10) Ask some one who has visited a summer resort on the seashore to tell you about it. (11) Is there any brook or river that you enjoy visiting? Where is it most beautiful? (12) Tell about some of the storms on the ocean described in Robinson Crusoe. (13) Do you know of any views that are made more beautiful by the presence of water? If so, where are they? Describe them. (14) Collect, from magazines, pictures of beautiful views with water in them. (15) Write a story, telling what you would expect to see in crossing the ocean. (16) Make a drawing of a ship.

For References, see page 109.

VIII. THE AIR

Since air cannot be seen, people often forget that it really is something; but a fire will not burn without it, and plants, animals, and men must have it to breathe. In fact, drowning means nothing more than sinking under water, where there is not enough air to breathe.

This is proof that the air is really something, even though it cannot be seen ; and you can prove the same thing in other ways. For instance, if you stand with your face to a breeze, you feel the air moving. Sometimes this movement of the air, which we call *wind*, is so rapid that it blows down trees and houses.

Here is an experiment to prove that the air is something and that it fills space.

Find an empty bottle without a cork and sink it in water with the open end up. Notice the gurgling noise as the bubbles of air rise to the surface, while the bottle slowly fills. Where does this air come from? And why does not the bottle fill more quickly? You see that although we called the bottle *empty*, it was really filled with air which could not be seen. The water could not enter the bottle until it pushed the air out, because the bottle could not be filled with two substances at the same time. So, as the air was leaving, the water was entering.

If the bottle is turned bottom upward, and pushed perfectly straight into water, the air will be given no chance to slip out, and then the bottle cannot be filled with water.

Air is something real and occupies space.

There is air all around the earth, and it extends many miles above us. This air, often called the *atmosphere*, is

usually in motion, now in one direction, now in another, and it often moves fast enough to cause a breeze, or wind.

Even when the wind is not blowing near the ground, it may be doing so far above, where the clouds are. You can see that this is so if you watch the clouds as they are driven along by the winds.

Let us see what causes the air to move. Heat has much to do with it. If you watch smoke in a room where there is a lighted lamp, you will see that it moves toward the lamp, and then rises above it (Fig. 66). Hot air also rises above a stove, or above a furnace through the registers; and during the winter, when there is a hot fire, the air near the ceiling of a room is much warmer than that near the floor.

Fig. 66.

Smoke rising from the table above the lighted lamp.

The reason for all this is, that when air is warmed, it is expanded and made lighter. Light objects, such as wood, will rise and float in water. So, also, when air is warmed and made light near a lamp, the cooler, heavy air all around flows toward the lamp and the warm air is forced to rise. It is, in fact, pushed up by the current of heavy, cool air.

Now we can understand the cause of winds. The at-

mosphere in one place, perhaps to the north of you, is colder than that where you are. This cold air, being denser and heavier than the warm air, begins to push it away, and thus moves toward you, forming a cold north wind.

People on the sea or lake shore often have such winds in summer, when, during a hot day, the air over the land becomes heated, while that over the water remains cool. The cool air then commences to move landward, and a cool sea breeze begins to blow.

Whenever the air is heavy in one place, and light in another, winds will blow toward the place where it is light. Since this lightness of the air is *usually* caused by heat, we say that

Most winds are caused by differences in the temperature of the air.

Winds are useful in many ways. They drive sailing vessels through the water, and they turn windmills (Fig. 68), which are often used to pump water from wells. But what is most important, they carry water all over the earth. At all times there is enough water in the atmosphere to fill many large lakes.

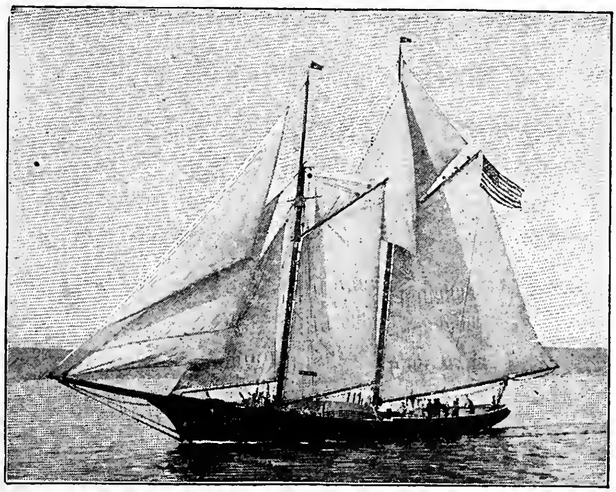


Fig. 67.

A sailing vessel driven through the water by the force of the wind. This is the picture of a fishing schooner going out of the harbor after a load of fish.

You know that there must be some water in the air, for wet clothes hung out on a line become dry as the water passes off into the air.

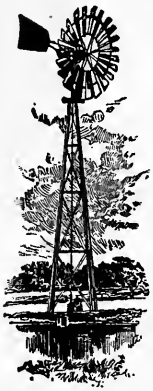


Fig. 68.
A windmill.

Some of the water in the atmosphere enters it after every rainstorm, when the muddy roads and wet fields are drying; but most of it comes from rivers, lakes, and the ocean. We have already learned (p. 63) that the ocean covers about three-fourths of the surface of the earth. The air is taking water from all parts of it, so that each minute enough water to fill thousands and thousands of barrels is leaving the ocean and floating away in the atmosphere.

Another reason why we know that there must be much water in the air, is that much comes out of it in the form of rain, snow, hail, dew, and frost.

The air takes up water from one place and holds it, perhaps for many days, during which time the winds may have carried it hundreds of miles; it may then be allowed to fall. Thus it is by the help of the wind that rocks are wet and caused to change to soil, plants are made to grow, rivers are furnished with water, and animals and people are given water to drink.

Persons living where there is plenty of rain perhaps do not realize how important it is; but there are some parts of the earth where the air is so dry that very little rain can fall from it. In these places, called *deserts* (Fig. 69), only a few kinds of plants and animals can live, while men generally avoid them.

The air obtains water from the ocean, and the winds carry it about.

What causes water to rise into the air? And why can we not see it there? If you watch a boiling kettle, you will see that "steam" rises from it. In a short time all the water will be boiled out of the kettle, passing into the air, where you can no longer see it.

The water in the kettle was a *liquid*, which could be seen; but heat has changed it to a *gas*, which, like air, is colorless and cannot be seen. Then, too, it is so light that it floats

FIG. 69.

Camels crossing the desert. Notice how barren it is.

round in the air. This water gas is called *water vapor*, and the change from liquid water to vapor is called *evaporation*.

It is not necessary to boil water to make it evaporate; for all over the earth, where there is water, vapor is rising from it into the air. You can prove this for yourself by placing a pan of water on a table and leaving it for some days, and then noticing how much of it has evaporated. It is in this way that the great amount of water, which every moment is rising from the ocean, is able to pass into the atmosphere.

Water vapor is obtained by evaporation.

When it falls from the sky as rain, the water vapor has changed back to liquid water. What causes it to do this?

Have you ever noticed a glass or pitcher of ice water "sweat" on a hot summer day (Fig. 70)? The water that collects on the glass has not leaked through, for there are no holes in the glass. What has really happened is that the air near the dish has been cooled so that the vapor in the air has collected in drops on the cold surface of the glass. Drops would gather there just the same, even if no water were in the glass, provided the surface remained just as cold.

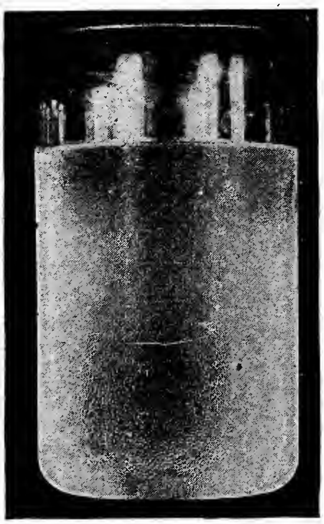


Fig. 70.

Little drops of water condensed from the vapor of the air on the outside of a glass of cold water.

On wash day, when a great deal of water vapor rises from the boiler, the windows are often covered with drops of water, because the vapor has been changed back to liquid, or *condensed*, on the cold window pane. Your own breath contains vapor, and you can change it to water by breathing on a cold window pane. So you see that if air loaded with vapor is cooled, some of the vapor gas is changed back to water.

There are several ways in which air may be cooled. You know that mountains are colder than the lower lands (p. 20); so that winds blowing over them are often chilled, and their vapor condensed. It is evident from this that mountains are an important help in causing rain.

Vapor may also be condensed when a cold wind blows against a warm one. Again, during summer the sun may shine down so hot that the air near the earth becomes warm. This makes it so light that it often rises high into the sky, where the air is so cold that the vapor condenses into rain. The summer thunder showers, which often come on hot afternoons, are caused in this way.

Vapor is condensed by the cooling of the air.

Fig. 71.

Clouds formed upon the mountain sides because the air has been chilled.

There are several different forms of condensed vapor. When you breathe into the air on a cold, frosty morning, your breath forms a little *fog* or cloud. The cold air has made the vapor change to tiny particles of water, so small that you cannot see a single one, though many of them together make a thin mist. You have no doubt seen fogs in valleys, on lakes, or over the ocean. These are always made of tiny drops of water condensed from vapor in the air.

Most *clouds* are also made of tiny fog and mist particles. These, too, are caused by the cooling of the air,

sometimes when it moves against mountain slopes (Fig. 71), sometimes when cold winds blow against warm ones, and sometimes when warm air rises high in the heavens and becomes cool (Fig. 72).

Fig. 72.

A summer cloud, often called a "thunder head," formed by the rising of warm air to such a height that the vapor is condensed.

Another form of condensed vapor is the *raindrop* which falls from the clouds. These drops begin as tiny mist or fog particles, and then, becoming larger and larger, grow so heavy that they can no longer float, but must fall to the ground.

We have seen that water may be either a liquid or a gas. There is still another form, the *solid*, which is produced when vapor condenses in a temperature below 32°, or the freezing point. Then *snow* or hail is formed instead of rain (Fig. 73).

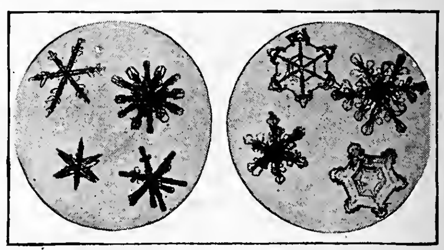


Fig. 73.

Photographs of snowflakes. Sometime, when light, feathery snow is falling, notice what beautiful forms it takes.

At night, drops of water often collect on the cold ground, on grass and leaves, somewhat as it does on an ice pitcher or the window pane. This is *dew*, which gathers because the ground cools quickly after the sun sets, so that the warm, vapor-laden air is chilled until the vapor is condensed.

If the temperature is below the freezing-point, *frost* is formed instead.

You will notice that raindrops, fog particles, and snowflakes form in the air, while dew gathers on grass and the drops of water on window panes. Really the raindrops and fog particles also gather on solid substances; for there are many tiny, solid particles of dust floating in the air, which you can often see dancing in a beam of sunlight, and it is around these that the rain, fog, and snow form.

It is condensed vapor that forms fog, mist, rain, snow, hail, dew, and frost.

Usually winds from certain directions, as from the ocean, are liable to bring rain, while others indicate fair weather. By keeping a daily record of the direction of the wind, and of the kind of weather it brings, you will be able to find out for yourself which of your winds cause fair weather and which rainy. You might also look at the thermometer at the same time and note the temperature. By these means you can learn something about the weather around your home. A record of this kind, which would be called a *weather record*, might be kept somewhat as follows:[1]

Date and Time of Day.	Direction of Wind.	Kind of Weather.	Temp.
Aug. 17, 1899, 8 A.M.	Southeast.	Cloudy.	70°
Aug. 17, 1899, 8 P.M.	Calm.	Gentle Rain.	72°
Aug. 18, 1899, 8 A.M.	West.	Clear.	68°

[1] If it is practicable, the teacher should at this point introduce an elementary study of weather maps and have the pupils read them each day.

Review Questions. — (1) Of what use is air? (2) How can you prove that air is something? (3) Describe the experiments with the bottle. (4) What do they prove? (5) What are winds? (6) Prove that there are winds high above the ground. (7) Why does the air rise over a lighted lamp? (8) What causes winds? (9) In what ways are winds useful? (10) How can you prove that there is water in the air? (11) Where does most of it come from? (12) What do the winds do with this water? (13) Of what service is the rain? (14) What becomes of water as it boils? (15) What is water vapor? (16) What is evaporation?

(17) What happens to vapor when cooled? (18) Tell some ways in which you can see condensed vapor. (19) In what ways can the vapor in the air be condensed? (20) Why can you "see your breath" on cold mornings? (21) How are clouds formed? (22) How cold must it be to form snow? (23) How is dew caused? Frost? (24) Of what importance are the dust particles in the air? (25) Tell how you would keep a weather record.

Suggestions. — (1) Why are stoves made so as to let in air for the fire? (2) What becomes of the air after it enters? (3) How does air reach the wick of a lamp? (4) Try a common drinking glass, instead of a bottle, to show that air takes up space. (5) Heat some muddy water and watch its movement. (6) Why does smoke go up, and not down, the chimney? (7) Show how a hot stove causes a movement, or circulation, of the air in a room. (8) Find out how your schoolhouse is ventilated. (9) How many examples can you give of evaporation of water? (10) Cool a piece of glass or iron and notice the vapor condense upon it, when the air is "muggy" or when steam is passing into the air. (11) Why do clouds frequently surround mountain tops? (12) See how early in the evening the dew begins to collect upon the ground. (13) What causes fogs to disappear? (14) Which winds usually bring rain to you? (15) How far have they probably carried the vapor? How long would it take them to do this, if they travelled at the rate of eight miles per hour? (16) Write a story, giving the history of a raindrop.

For References, see page 109.

IX. INDUSTRY AND COMMERCE

Every man is expected to engage in some kind of work, or *industry*, in order to earn a living. For instance, farmers raise stock and grain, while gardeners produce vegetables and fruit. The crops they raise vary with the locality.

Some men, instead of working in the soil, are engaged in manufacturing such articles as shoes, cloth, and materials used in building and furnishing houses. Are there any of these men in your vicinity? If so, what do they make? You can at least find a blacksmith shop, or a tin shop, or a house that is being built. Notice how many different materials are used by the workmen.

Storekeepers do neither of these two kinds of work. What, then, do they do? Notice how many articles the grocer keeps in his store, also the dry-goods merchant, and others whose stores you visit. Where do they get them all?

At the present time it is easy, where most of us live, to buy almost anything, and to find men who can do almost any kind of work. We are so accustomed to all this that we are apt to forget that it has not always been so.

Not many hundred years ago there were no stores or houses in this country; and each family, as it settled here, was obliged to find its own food, make its own clothing, and build its own house.

Let us study more fully how people lived in those days, and how changes have gradually been made until the present manner of living was reached.

The first persons who left Europe, and crossed the Atlantic Ocean to live in this country, naturally settled along the coast, because that was the first place reached.

But soon men began to push into the wilderness further west. Often several families settled together, miles away from other people. Sometimes a single family would go off alone, and make a home ten or twelve miles from the nearest neighbor. Most of the United States was first settled by these scattered *pioneer* families.

Of course when a man started out he took some articles with him, as a gun, with powder and bullets, some clothing, and some blankets; but upon arriving at his new home he was obliged, like Robinson Crusoe, to rely upon himself.

FIG. 74.

A log house, such as the pioneers used to build in the forests.

The first houses in the wilderness were built of rude logs, the cracks between them being filled with mud. Often there was no floor except the earth, and only one room, in which the family had to cook, eat, and sleep. The hardy pioneers had few comforts. There was no furniture but of their own making. The only table was part of a log supported upon four legs. Three-legged stools served for chairs, and the bedsteads were often merely posts driven into the ground or floor, with crosspieces. At first, the outer clothing worn by the settlers was commonly made of the skins of the deer and bear, while undergarments were woven out of homespun

cotton. It is said that when Daniel Boone went to Kentucky, his shirt and trousers were made of deerskin, and that Lincoln as a boy wore a raccoon-skin cap and deerskin trousers. Corn was the staple crop, while for meat the early pioneers depended largely on wild game. Coffee was seldom to be had; the tea was often made from roots found in the forest; and the children never had candy or cake except such as their mothers made for them. There were few books and practically no newspapers, and it was not unusual for months to pass before one could hear of important happenings in the outside world.

Such was the life of the early frontier settlers. Usually they raised their grain and wheat for bread. They kept sheep and made the wool into yarn, blankets, and cloth. If a boy needed a new suit of clothes, his mother would make the cloth, cut it, and sew it. They were obliged to do nearly everything for themselves.

As a rule, each man raised more of some things than his own family could use, as wheat, wool, or hogs; but there were others that he had to buy, as powder, sugar, salt, pepper, and coffee.

It was the custom, therefore, to drive two or three times a year to the nearest large town, perhaps a hundred miles away, taking the products of the farm and exchanging them for necessary articles.

These trips had to be few, for the roads were often rough, muddy, and dangerous. It might require two weeks or more to haul a load of grain to town and bring back the coffee and other materials the family wanted. In parts of the world, where there are few settlers, people are still living in this manner.

But one family did not usually live long alone, for soon others came and settled near them. Perhaps several built their houses near together, forming a little village.

Now that there were more people, the kind of work

that each did began to change. Perhaps one of them built a saw-mill, and sawed lumber for the others when they needed it. Another spent part of his time at carpentry work for his neighbors. A third built a grist-mill, and occasionally ground grain into flour. A fourth made shoes, or clothes, a part of his time, or he doctored the sick, or preached, or taught school.

Perhaps the blacksmith spent all of his time in his shop, shoeing horses, making ploughs, etc., while the storekeeper did nothing but buy and sell goods. He went to the city and bought the supplies that he thought his neighbors would need, such as matches, boots, shovels, calico, and drugs, and these he kept in his store for sale.

It was not then necessary for the farmer to go to the distant town, because he could usually find what he wanted at the store ; and if he raised more potatoes than he needed, he could take them to the storekeeper and get coffee in return. Or he would receive money for them, and with this pay the blacksmith who had shod his horses, or the doctor, or teacher. In many of the less settled parts of the country this is the way people are still living.

Each year more people took up land, until most of it was carefully cultivated, and towns and cities grew up (Fig. 75). Then they began to live in the way that is now so common. That is, each man now confines himself to one or a very few kinds of work, and depends upon other men for the other things that he needs. Those who live in the country are chiefly farmers, and raise the food that we eat. Others work in mines, digging coal, iron, lead, copper, silver, or gold out of the ground.

Many, instead of raising crops or working in mines, are employed in mills and factories. One saws logs into lumber, or makes doors ; another manufactures cloth,

another needles, another shoes. Others follow the industry of tailoring, tanning hides for leather, making clocks, etc.

Still others are engaged in a third kind of work. They do nothing but buy and sell such articles, and among these are all the merchants that we see in the stores.

Under these conditions the work that one man does is not only of one kind, but it may be of a very narrow kind. For example, a man may do nothing but drive a team. Or he may make shingles, or drive nails, or tie up sacks of flour, or put in the heads of barrels. How different this is from the work of the pioneers!

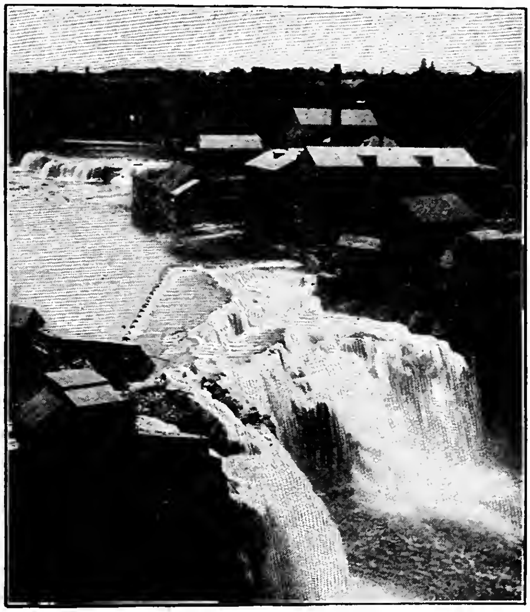


FIG. 75.

The city of Rochester, in New York, has grown up near these beautiful falls on the Genesee River. Some of the factories that use the water power are seen in the picture.

As a rule, each town or city is specially interested in one or a few kinds of business. For example, a town surrounded by extensive woods is likely to have an important lumbering industry. Another, in the midst of mountains, may make mining its especial work; or another, near great wheat-fields, may have immense flour mills.

Thus each town, like each man, is apt to be interested in the production of few things; what they raise or man-

ufacture is sent away in all directions, and the other articles, that the people in the town want, are brought to them from the many places in which they are produced. Find out what is made in your own town, and some of the substances that are brought to it.

When people are so dependent upon others for most of the materials that they use, it is clear that roadways become of great importance. For if the best wheat for flour is raised in Dakota, if the best shoes and cloth are made in New England, and if the best cotton, corn, and tobacco are grown in the South, what good will they do us if they cannot be brought to us?

The pioneers had no roads at first. The early settlers who crossed the Alleghany Mountains into the region from which has been formed the present states of Tennessee, Kentucky, Ohio, Indiana, and Illinois had to find their way through the dense forests.

FIG. 76.

A pack train, on a mountain road, carrying supplies to a mine on the mountain side.

One of the early customs was to follow a *trail*, or narrow path, and, instead of using a wagon, to carry goods strapped upon one's own back, or else upon horses or mules. A number of horses carrying packs formed a *pack train* (Fig. 76). Pack trains are still common in some places.

Later, when roads were more common, they were often rough and muddy; and as there were few bridges, streams often had to be waded or *forded*.

A great deal of labor has been spent in making good roads. Not only must trees be cut down and stumps and stones be removed, but steep places must often be levelled. Bridges are also necessary, and much work must be done to keep the roads in repair. In some places where there is much travel, as in eastern Massachusetts, great sums of money are spent in making excellent roads.

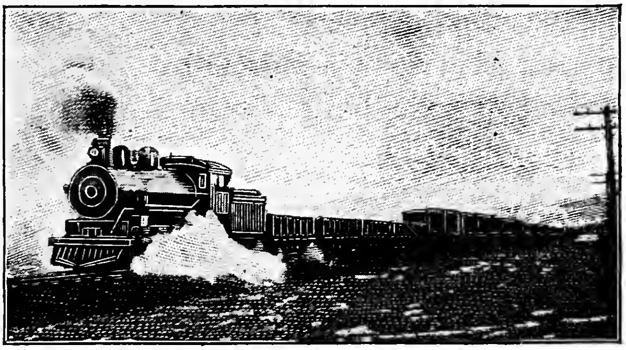


FIG. 77.

A long freight train, on the Northern Pacific Railway, crossing the Rocky Mountains. There is another engine in the middle of the train and a third on the rear end.

There is so much carting in cities that their streets must be paved. Bricks are often used; or stones larger than bricks are laid down side by side; and in many cities, asphalt pavements are common. What kind of streets have you seen, and how were they built?

We have already (p. 50) considered the importance of rivers as roadways. For a long time the Mississippi River with its chief tributaries, such as the Ohio, the Arkansas, and the Missouri, was the only roadway to the great city of New Orleans, and to-day these rivers are the commercial highways of parts of sixteen states situated in

the Mississippi basin. Between New Orleans and cities on these rivers numerous boats constantly ply, carrying grain and cotton, and goods of all kinds.

But railways are, in many respects, the best roads. Even with the finest of wagon roads, people and goods cannot usually be carried more than twenty to forty miles in a day. Boats are somewhat faster ; but railway trains travel from four hundred to a thousand miles per day, and they take both passengers and freight much more cheaply than they can be carried in wagons.

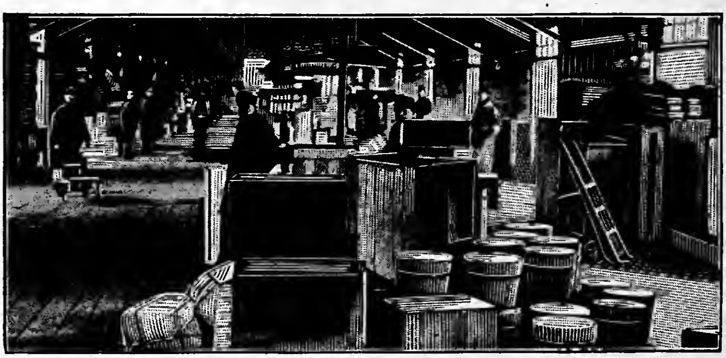


FIG. 78.

A view in a freight depot at St. Paul, Minnesota.

As we ourselves travel on passenger trains, we are inclined to think that the chief business of railways is to carry people ; but this is not generally the case. Their main business is to carry freight, such as grain, cattle, groceries, and machinery ; and by doing this they have had a great influence upon the development of the country.

For example, a few years ago it would have done little good to raise sheep, wheat, and fruit in the far west, because they could not be sent to the great cities to be sold ; but since the railways were built, these industries, and

many others, have become of great importance. There is therefore much more buying, selling, and carrying — that is, much more *commerce* — than before the railways were built.

Fig. 79.
A freight yard with many freight cars.

Letters, newspapers, and express packages are now carried very rapidly on the trains. Formerly they were sent in stage coaches or on horseback; but now many passenger trains have one or two cars used for these purposes alone.

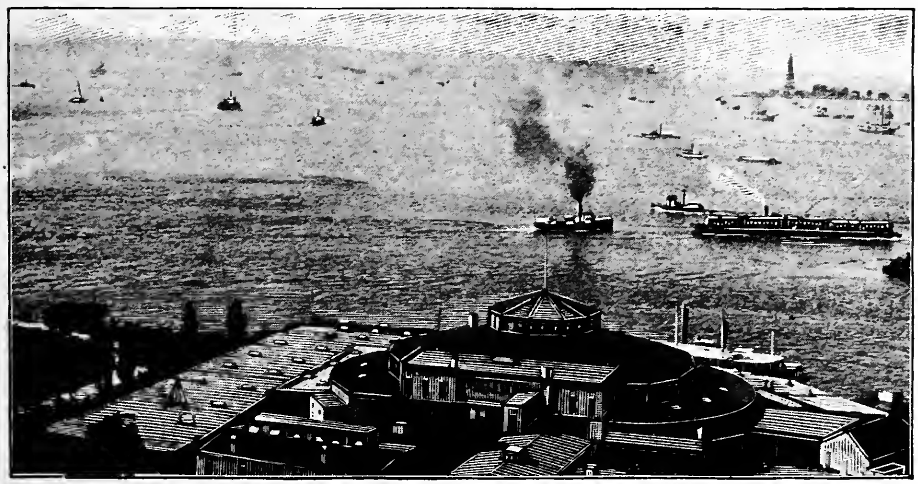


Fig. 80.
A view in New York harbor showing the vessels coming and going.

It is clear that good roadways, whether made of soil, water, or iron, are a great help to trade. In fact, without them there could be very little commerce. The wagon

roads in the country and city are of great value in carrying goods for short distances as, for instance, to the river wharf or the railway station. Then boats and trains are used to carry them further.

Not only is there commerce on the land, but, as we have already seen (p. 64), thousands of vessels are engaged in carrying freight on the ocean. They are constantly passing up and down the coast of the United States, going from one city to another (Fig. 80) with loads of cloth, iron, grain, lumber, and hundreds of other articles.

Vessels are also going and coming at all times between the United States and foreign countries, bringing materials which we need and taking back some of our products. This is known as *foreign commerce.*

Review Questions. — (1) What do merchants do? (2) Who are pioneers? (3) Describe a house such as the early pioneer was commonly accustomed to live in. (4) Tell what you can of the life and the dress of the early settler. (5) Tell about the trips to the nearest large town.

(6) How did the work of each man change when the people began to live in villages? (7) Give some examples. (8) What would you expect to see in a general store? (9) Make a list of articles that are manufactured. (10) Name several industries. (11) How has the work of each man changed as great numbers of them have settled together? (12) In what ways have men become dependent upon one another? Give examples.

(13) Show that roads are of great importance. (14) What kind of roads did the early pioneers have? (15) How did they cross the streams? (16) Why must streets in cities be paved? (17) In what respects are railways better than other roads? (18) Tell how railways have helped to develop our country. (19) What is meant by commerce? (20) By foreign commerce?

Suggestions. — (1) Make a list of the crops grown in your neighborhood. How is the work done? (2) Do the same for manufactured

articles. (3) Have you read the life of Daniel Boone or that of Lincoln? (4) What were some of the things Robinson Crusoe had to do for himself? (5) Write a story describing an early pioneer's journey to the nearest large town.

(7) Visit a general store in the country. (8) Visit a factory, a blacksmith shop, or a mill. Describe the visit. (9) Make a list of articles that you use which were probably brought from a distance on the railroad or on water. (10) Find out where some of them came from. (11) What is meant by a ford? The last syllable in the name of a great many towns is *ford*, as Hartford, Stamford, and Rockford; what does that suggest to you? (12) Visit a street where pavement is being laid. (13) Have improvements been made in any river near you?

(14) What freight goods have you seen carried on the nearest railway? (15) Visit a freight house to see what is inside. (16) Find out where the boxes, etc., come from. (17) Count the number of freight cars and of passenger cars that run over the railway during one day. (18) Name as many substances as you can that come from over the ocean. (19) Write a story giving the history of the material of your dress or coat; of your shoes. (20) Find out some facts about bananas as, for instance, where they are grown and how they are brought to you. Do the same for coffee, tea, sugar, and other articles of food.

For References, see page 110.

X. GOVERNMENT

Every boy and girl has heard men talk about *voting*, and has noticed how interested they often become as election time approaches.

But do you know what voting is for? Do you know why the day for voting is called *election day?* Find out what you can about voting and election.

Laws and *officers* are frequently mentioned when men are talking about election. Can you name some laws; and do you know any officers? You have certainly seen a policeman: what does he do? You have heard of judges, and of the President: can you state anything about them? Can you mention any other officers?

In our study of commerce we saw that it required a long time to reach our present way of living and carrying on trade. So it is with our government. At present we have many laws and officers, while long ago there were very few of each. Let us see why this is so.

The farmer manages his farm nearly as he pleases. He puts up fences, sells his grain, or feeds it to stock, as seems to him best; and when repairs are needed, he looks after them himself. The miller builds a large or small mill, uses old or new machinery, grinds much or little corn, and makes repairs, as he chooses. In each case, one man owns and uses the property.

But there are some things that no one man owns and that all wish to use. This is true, for instance, of roads.

All people drive or walk over them, yet they belong to no one person. Who, then, should build roads in the first place, and who should decide upon and make necessary repairs on them?

Again, there are public schools which no one man owns and which many wish to use. Large yards, good buildings, and good teachers are all desirable, but who should provide for them? This and many other questions arose in early days (and still arise) and had early to be dealt with in some way. The organization which any community has for dealing with these public questions is called its *government*.

The first permanent English settlement in America was at Jamestown, in Virginia, and its government was managed by seven men appointed by the King of England. At first the people had no right to vote, but later, when Virginia came to have a number of settlements, a body called the House of Burgesses, composed of two men from each settlement, was elected to make the rules or *laws* for all parts of the colony.

In the New England settlements, government was introduced in a different way. The people lived in *towns* and each town governed itself. *Town meetings* were held which adopted rules or laws regarding roads and schools and *elected officers* to enforce them. The same meetings passed laws to punish persons who committed crimes, and elected officers called *constables* to arrest offenders. All the people in the small towns (Fig. 81), therefore, had a voice in making the laws by which they were to be governed.

When towns became more numerous, there were many things which concerned more than one town, to be decided. For example, in early days questions arose as to the highways which joined these towns, just as to-day there is the question of regulating railway companies which charge too much for carrying passengers and freight. In such cases laws may need to be passed, compelling them to charge reasonable rates. But as these railways are scores,

or even hundreds, of miles long, the people of a single town could do very little with them. In that case it would be necessary for those living perhaps hundreds of miles apart to unite in some way in order to make laws.

Again, it is important that there be buildings in which blind people may be properly cared for, in which the deaf and dumb may be educated, and insane people confined. There must also be strong prisons where criminals may be sent. But in any one town there are not many such persons, and it would prove very expensive to take proper

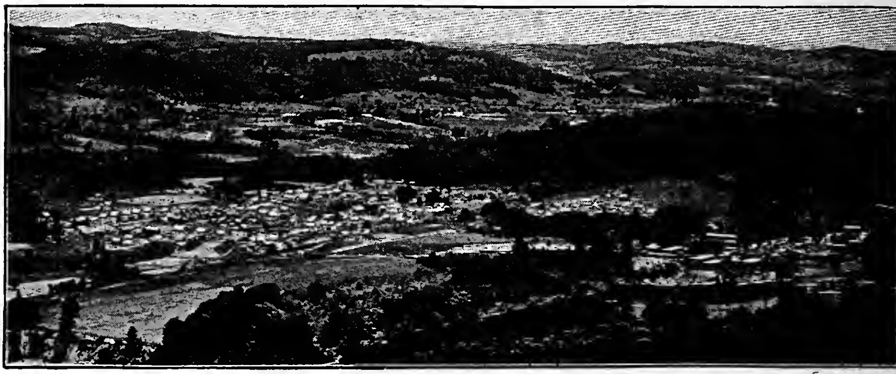


FIG. 81.

A small New England town, nestled in a valley among the hills, fields, and forests. Tell what you see in this picture.

care of only a few. This is another reason why a number of people should unite to make laws on some matters.

Therefore, while there must be a *town government*, there must be also a *state government*. Virginia started with the state government and worked down to the town, or rather *county*, government, while New England began with the town and worked up to the state.

All the men of a state cannot assemble at one point, from a distance of one or two hundred miles, in order to attend to such matters. Even if they could make the journey at the time appointed, there would be so many of

them that they could not hear one another speak, and little business could be carried on.

For these reasons it is necessary for one man to be elected to *represent* many others. Where there are a great number of people, he may represent many thousands.

Suppose, for instance, that there are a million people living in a state and that one man is elected to represent every ten thousand; there will then be one hundred such men chosen, and it will be their duty to meet together to make laws for the whole million.

Such men, being chosen to represent the others, are often called *representatives;* and because they *legislate* (which means "make laws"), they are together called the *legislature.*

Fig. 82.

The state capitol of Indiana at Indianapolis.

In order to meet together, these men must assemble in a certain place, and that place is called the *capital* (*capital* means head city) of the state. This is a city, often near the centre of the state, in which there is a fine building, called the *state capitol* (Fig. 82), where the representatives hold their meetings.

We saw that in the town the people not only made laws, but elected men to see that they were enforced. Such men are necessary for the state also. The leading officer, chosen to enforce or *execute* the laws, is the *governor*, sometimes called the *chief executive.*

In large cities (Fig. 83) there are so many people that they must also be governed by representatives, as the people of the whole state are governed. The men who make the laws are often called *aldermen* and *councillors*, and the highest officer, elected to execute the laws, is known as the *mayor*. The building in which these representatives meet, and in which the mayor has his office, is the *City Hall*. While a city is governed by its own officers in some matters, it is still a part of a state, and elects representatives to the state legislature.

FIG. 83.

A crowded street in the great city of New York. Notice the high buildings and busy streets. Many officers are needed in such a city. Indeed, there are more policemen in New York City than there are men, women, and children in some towns.

In our country there are many states, and there are some matters that no one state can decide alone, because all the others are equally interested in them. For instance, it would be a great hindrance to travel and trade if each state made its own money; for then each one might have a different kind, with coins of different names and weights. Every time a traveller passed from the state of New York to Pennsylvania, or Massachusetts, he might be obliged to take the time and trouble to exchange his money for a new kind.

Again, in case of war it would be impossible to make much progress if each state acted independently. Perhaps you can give some of the reasons why. Mail is another matter that concerns all the states, and there are still others besides. Can you mention some?

So it is evident that we need a *United States Government*, as well as state, city, and town governments. The reason for calling it the United States Government is also plain; for the states have really *united* in order to have one central government for some of their most important affairs.

If the people of a single state cannot meet in a body to make laws, certainly those of the entire United States cannot do so. Representatives are elected and sent, from all the states of the Union, to one place where they consider the affairs of the whole nation. The place where they meet is the city of Washington, and it is on that account the *capital of the United States*. Here is a magnificent *capitol* building (Fig. 85) in which the meetings are held; and there are many other great government buildings besides. (See Fig. 85.)

FIG. 84.

A picture of George Washington, after whom the capital is named. Find out what you can about him.

The representatives from all the forty-five states of the Union form what is known as *Congress*. This corresponds to the legislature of the states, the congressmen making laws for the nation, as the legislators do for the state. The members of Congress are called *senators* and *representatives*. The executive officer of the United States, corresponding to

the mayor of a city and the governor of a state, is called the *President.* He lives in Washington, and his residence is called the Executive Mansion, or the White House, since it is painted white (Fig. 85).

Besides these officers who are elected by the people, there are a great many others appointed by the President to carry on the government work. Many live in Washington, but some, as postmasters, live in other places.

We have seen how the people in small towns arrange for their home government, and how, uniting with those in other towns, they elect some men to represent them at the state capital and others to represent them at the national capital. These representatives are elected by means of votes that are cast for them.

Because the people make their own laws, our government is called a *democracy.* The first part of this word means "people," and the last part "government," so that the whole word means "government by the people." Because the people do not make all the laws themselves, but allow their representatives to make them, it is often called a representative government or a *republic.*

It is often said that our form of government makes us free and equal. People are by no means so free and equal in all countries. Under some governments, in Europe and Asia, the people have very little to say about the laws that shall govern them. Nor do the laws protect them all equally, for the high officers say freely what they think, while others do not dare to do this. They must obey their rulers blindly, just as little children are expected to obey their parents.

Such a government cannot be called a democracy or a republic; it is indeed a *despotism*, or an *absolute monarchy.*

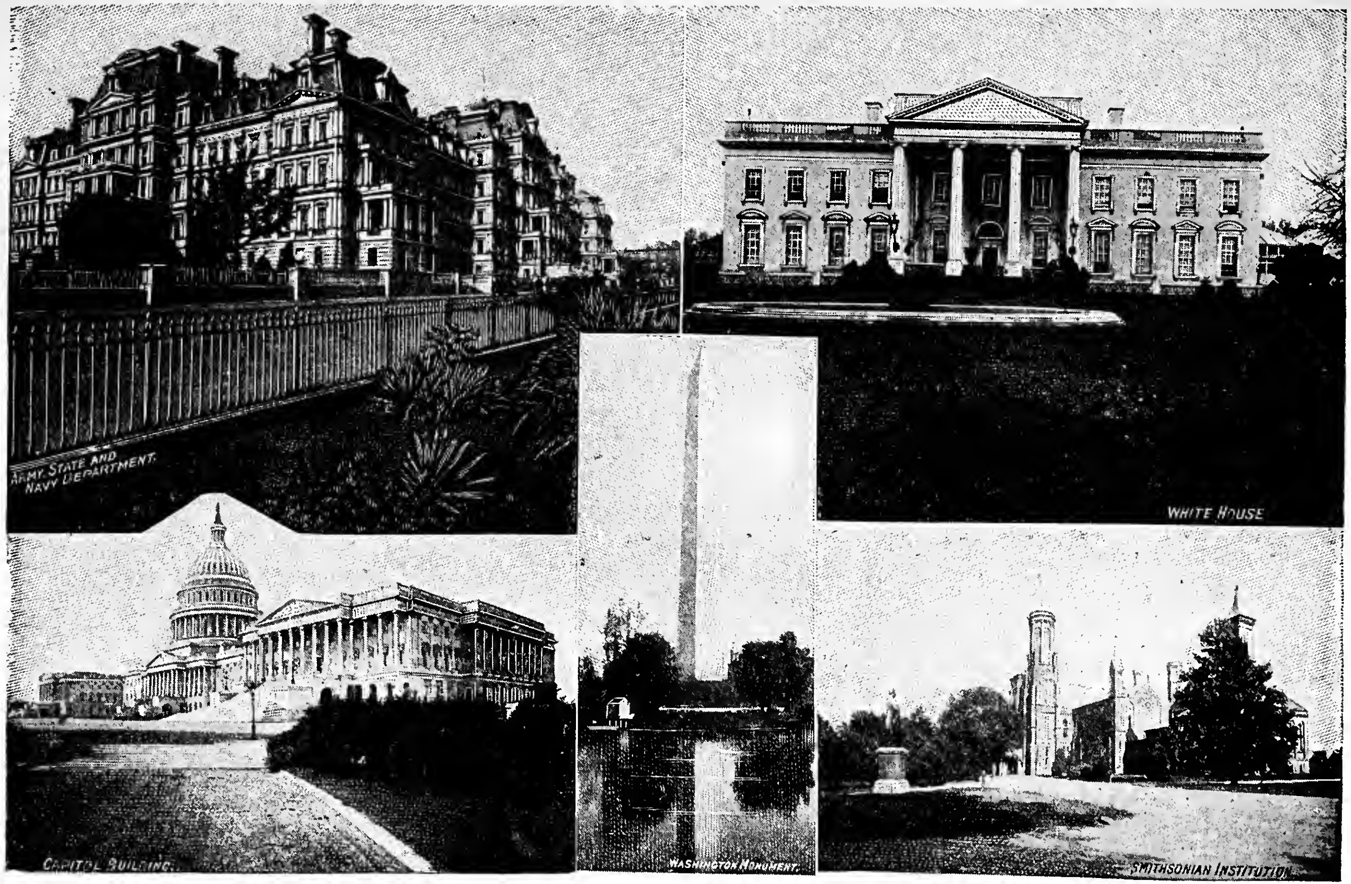


Fig. 85.

A group of government buildings at Washington.

This means that the ruler is a *despot*, or a *monarch*, having complete or absolute power to do what he chooses. For instance, he puts men to death without any trial, a thing that the laws of our country do not allow. China and Turkey are examples of this kind of government.

There are other nations in which the people have more freedom than this, but not so much as we have. They are allowed freedom to do some things which they wish, while in other matters they are compelled to obey, without even asking any questions. Spain has a government of this kind. Since the people have *some* rights by which the monarch's power is checked or limited, this government is called a *limited monarchy*. Some limited monarchies, however, like England, allow a very considerable freedom.

Review Questions. — (1) Name a few things that no one person owns and that all wish to use. (2) How did the pioneers arrange for roads? (3) Why was a constable necessary? (4) What are laws? (5) Why must a great many towns and villages unite in order to make laws? (6) Name some of the objects for which they must unite. (7) What is a state? (8) How are laws made in states? (9) Why are the men that are elected called representatives? (10) What is a legislature? (11) Where does it meet? In what building? (12) Where does the governor live? (13) Why must large cities also be governed by representatives? (14) Name some of the city officers. Where do they meet?

(15) Why should not each state make its own money? (16) Why are these states called the United States? (17) Where do the representatives of the United States meet? In what building? (18) What is Congress? (19) What is the White House? (20) What does the word democracy mean? (21) Why is this government called a republic? (22) How are people in many other countries less free and equal than we are? (23) What is a despotism? An absolute monarchy? Give examples. (24) What is a limited monarchy? Give an example.

Suggestions. — (1) What persons repair the roads or streets where you live? (2) How are they chosen? (3) What officers look after the schools? (4) How is your constable or policeman uniformed? (5) Attend a trial to see how it is conducted. (6) What are taxes? (7) In what state do you live? (8) What is the name of your state capital? (9) How far is it from your home, and in what direction? (10) Who is the governor of your state? (11) If you live in a city, who is the mayor? Where is the City Hall? (12) Ask some friend who has travelled in foreign countries if he had much trouble with the different kinds of money. (13) What does U. S. stand for? (14) In what direction is the city of Washington from you, and how far is it? (15) Who is living in the White House now? (16) Where are the nearest polls for voting? (17) Have some one show you how he votes. (18) What is meant by the statement that a "majority rules"?

For References, see page 110.

XI. MAPS

We often wish to represent a country upon a map so as to tell, at a glance, its shape, and where the mountains, rivers, and cities are located. Such a drawing can be made of any place, no matter how large or small it is.

Fig. 86.

Picture of a schoolroom which is 32 feet long and 32 feet wide.

Suppose we desired to draw only a schoolroom (Fig. 86), which is perhaps 32 feet long and 32 feet wide. It would not be easy to find a piece of paper so large as that, and it would not be necessary to do so. A small piece would do, because 1 inch upon it could be allowed to represent several feet in the room.

In this case let an inch stand for 16 feet. Since the room is 32 feet on each side, and there are two 16's in 32, the drawing will be just two inches long and two wide. To place the desks and aisles properly, we will need to use a ruler divided into sixteenths, for one foot in the room represents $\frac{1}{16}$ of an inch on the ruler.

The ends and sides are marked (Fig. 87) north, east, south, and west. The teacher's desk is $3\frac{1}{2}$ feet in front of the north wall. There is a row of desks about 4 feet from the west wall. The desks are just 2 feet long, with eight in a row $1\frac{1}{4}$ feet apart. There are seven rows; and the aisles between them are each $1\frac{1}{4}$ feet wide. Here is a

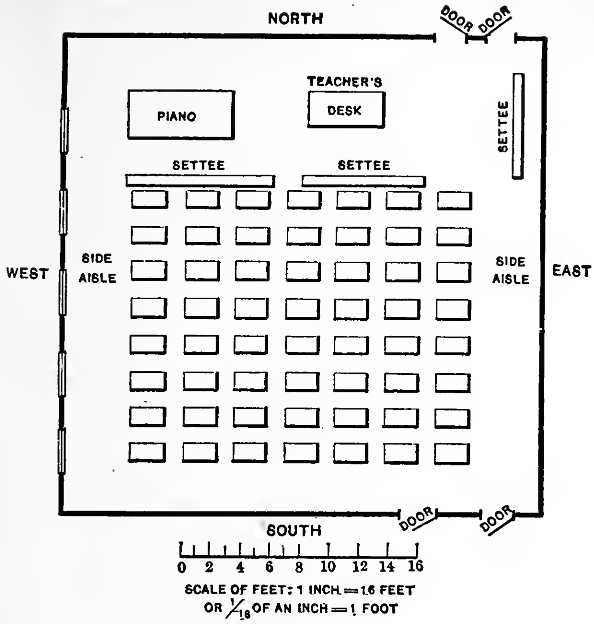


FIG. 87.

A map of the schoolroom shown in Figure 86.

map of the schoolroom (Fig. 87). Measure each part to see if it has been drawn correctly, using a foot rule that shows the sixteenths of inches. How large is the desk? The piano?

When a person draws in this way, letting a certain distance on the paper represent a much greater one, he is said to use a *scale*, or to make a map *according to a scale*. In the schoolroom just described (Fig. 87), the scale is 1 inch to 16 feet.

In the next drawing, that of the school yard (Fig. 88), the scale must be much larger, because the yard is so

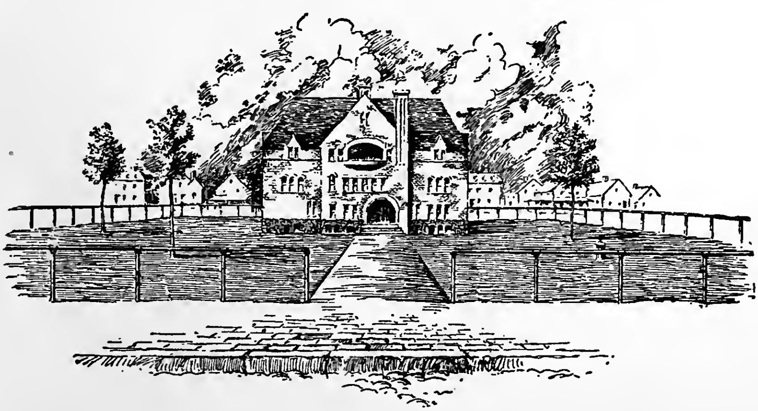


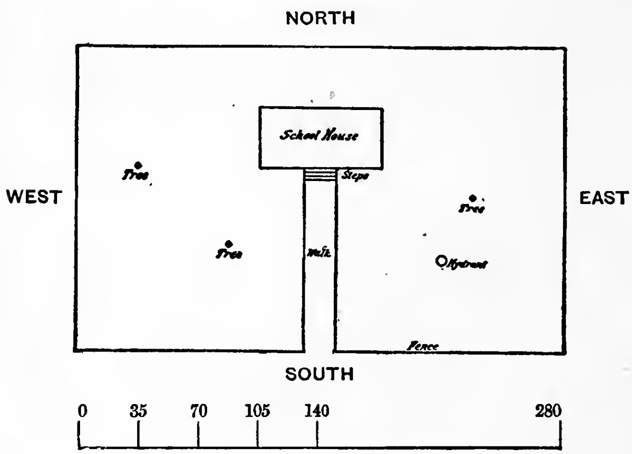
FIG. 88.

Picture of a school yard. Figure 89 shows a map of this.

much larger than the room. Here one inch represents 140 feet. According to that scale, find out how large the yard and the school building are (Fig. 89). Find how far the trees are from each other, from the nearest fence, and from the building.

Can you not make a map of your own schoolroom? What scale will you use? Put in your own desk, but omit the others, if you wish.

You might also draw a map of your school yard. If you prefer to do so, find its size by stepping or *pacing* it off, making each of your steps about two feet long. Measure the building in the same way. After having finished these two maps, draw a third one, including in it not only the school yard, but also a few of the neighboring streets and houses. The scale for this might perhaps be 1 inch for every 500 steps.



Scale in feet: 1 inch equals 140 feet.

FIG. 89.

A map of the school yard shown in the picture, Fig. 88.

All maps are drawn to a scale in this way, whether they represent a school yard, a state, the United States, or even something still larger. Opposite page 140 you will find a map of North America. On what scale is it drawn? Look at some other maps to find out the scale.

Maps are used a great deal to show the direction of one place from another. But a person must first understand what is meant by north, south, east, and west. Probably you already know that.

One of the easiest ways to find the direction is by a *compass* (Fig. 90). This is simply a piece of steel, called a needle, that swings about easily and always points to the north. It is magnetized, like the horseshoe magnets that you have seen, and it points northward, because something draws it in that direction; but no one knows certainly what this "something" is.

FIG. 90.

A compass. The letter N means north. What do the other letters stand for? Notice that the needle is pointing north and south.

When the stars are shining, one can tell which direction is north by the help of the Great Dipper. The two stars on the edge of the Dipper point toward the North Star. It is so bright that it can be easily picked out, and it is always to the north of us.

One can also find direction by the help of the sun; for, as you know, it rises in the east and sets in the west. Accordingly, when one faces the rising sun, his right side is to the south and his left to the north. Which direction is on his right and left when he faces the west? The south? The north?

Northeast means half way between north and east. Southeast means half way between south and east. What, then, do northwest and southwest mean?

Point north, east, west, south, southwest, northeast, northwest. Walk a few feet in each direction. What direction is your desk from that of your teacher? From the desks of your friends? From the door? What direction is your home from the schoolhouse? From other houses? In what directions do some of the streets extend?

Now let us tell directions on the map. Lay your drawing of the schoolroom upon your desk, so that the line

representing the north side of the room is toward the north. Also place yourself so that you are facing directly north as you look at the map. If your desk faces the wrong way for this, turn round, or put your map upon the floor. Now, north on the map is also north in the room, and the other directions on the map correspond with those in the room. In which direction, on the map, is the door from your desk? From the teacher's desk? Place your map of the school yard in the same position and give the directions.

You see that the north side of this map is the side furthest from you; the east side is on your right, the south next to you, and the west is on your left. When a map is lying before us, we usually look at it from this position.

But it is not always convenient to have a map lying down, especially in the schoolroom, where it must be hung up so that the whole class may see it.[1]

Let us hang up one of these maps and take particular pains to put it upon the north wall. Which direction on the map is north now? It is evident that the north side must be *up*, while east is *on the right*, south is *down*, and west is *on the left*. Certain lines, called lines of longitude, extend due north and south, and others, called lines of latitude, east and west. You should drill yourself to understand directions on maps.

Give the directions of objects from one another while the map is hanging up. Put up the map of the school yard, and any others that you have, and tell the directions from one place to another.[1]

[1] After the children are quite at home in using the map when it is hung on the north wall, hang it on other sides of the room and have them give the directions. This is easy work if properly graded; but the fact that many children studying geography are confused in regard to directions on the map suggests that caution be exercised.

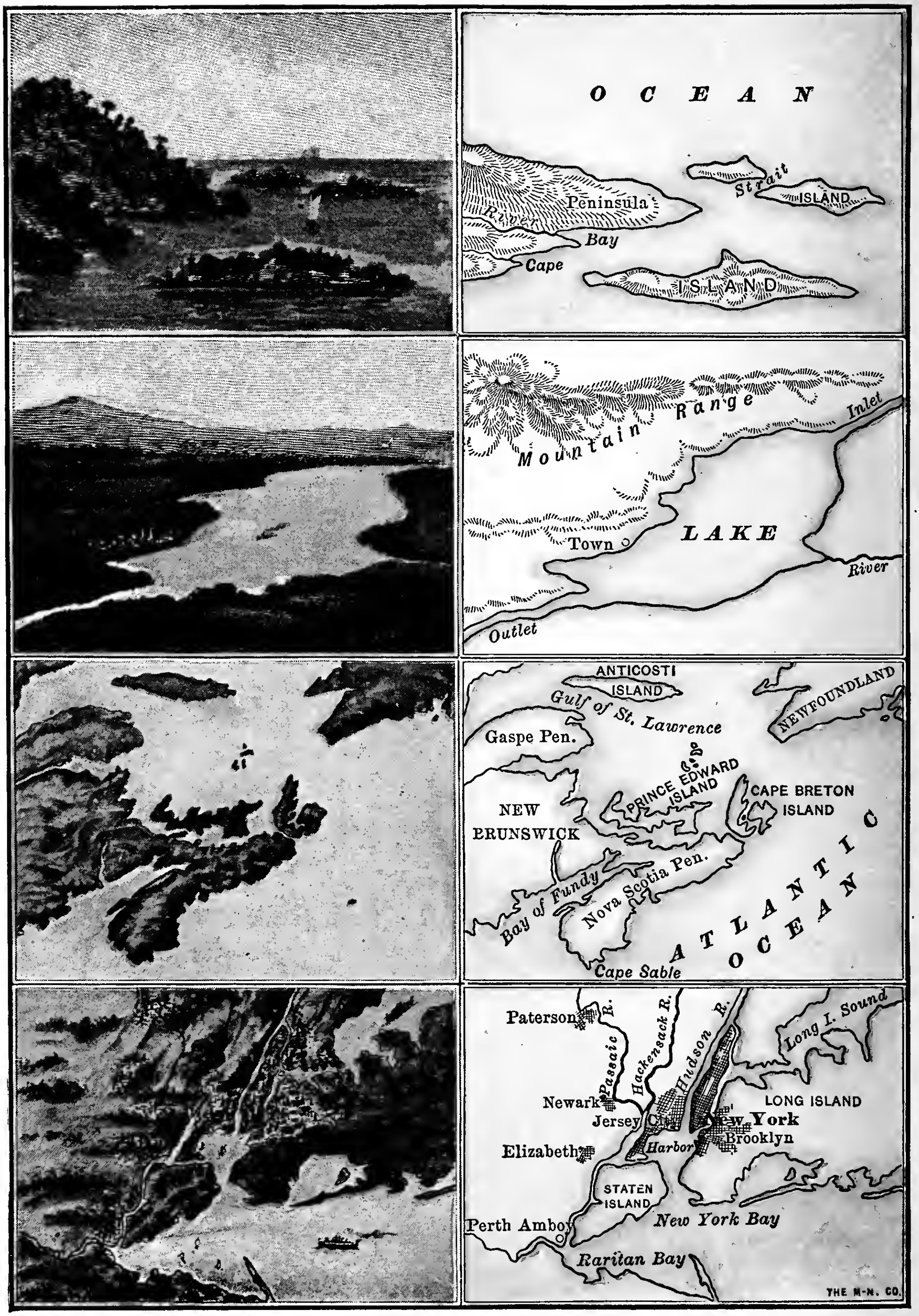


FIG. 91.

To show what maps mean. The left-hand figures show the country as if you were looking down upon it; the right-hand figures represent the same country on maps. Tell what you see in each of these

It is clear now what a map is. It is a drawing telling something about a country, just as a letter may be some writing telling something concerning a friend. When you read such a letter, you think of your friend, how he looks, what he has been doing, etc. So when you look at a map, you should think about the country, how it looks, how far apart the places are, etc.

The maps that you have been drawing are flat maps, representing the country as if it were a flat surface. In Figure 91 you will see the way in which these maps are made to represent the land and water. No attempt is made on the flat maps to show just what the country looks like. They represent the position and direction of towns, rivers, lakes, etc., just as if the country were perfectly flat.[1]

Later on you will study *relief* maps. These show the mountains and valleys. They are pictures of the land as it might appear if one were to look down upon it from some point far above.

For REFERENCES, see page 110.

[1] If it seems desirable, the teacher may introduce the study of contour maps at this point. The children could draw a contour map of their own neighborhood, and then possibly make a relief map from it by cutting out pieces of pasteboard that correspond to the spaces between the lines. Relief maps may also be constructed by modelling in sand.

REFERENCES TO DESCRIPTIONS, IN PROSE AND POETRY, OF TOPICS TREATED IN HOME GEOGRAPHY. FOR TEACHER AND PUPIL

McM. means The Macmillan Co., New York; Ginn, Ginn & Co., Boston, Mass.; A. B. C., The American Book Co., New York; S. B. C., Silver, Burdett & Co., New York; Heath, D. C. Heath & Co., Boston, Mass.

Section I. The Soil. — King, "The Soil" (McM., $0.75); Tarr, "Elementary Geology," Chapters VI, XI, and pp. 475–487 (McM., $1.40); Shaler, "First Book in Geology," pp. 24–29 (Heath, $0.60). Also other geologies. *Nature Study Quarterly*, No. 2, October, 1899 (Cornell University, College of Agriculture, Ithaca, N.Y. Free on application); Kingsley, "Madam How and Lady Why," Chapter IV, "The Transformation of a Grain of Soil" (McM., $0.50); Wilson, "Nature Study in Elementary Schools. Teacher's Manual," p. 177 (McM., $0.90); Frye, "Brooks and Brook Basins," section on "How Soil is made and carried" (Ginn, $0.58); Strong, "All the Year Round," Part II, sections 7 and 8 (Ginn, $0.30).

Section II. Hills. — Whittier, "Among the Hills" (poem); Whittier, "The Hilltop" (poem); Hutchinson, "The Story of the Hills" (McM., $1.50).

Section III. Mountains. — Lubbock, "The Beauties of Nature," Chapters V and VI (the former on forests) (McM., $1.50); Jordan, "Science Sketches," section on "The Ascent of the Matterhorn" (A. C. McClurg & Co., Chicago, $1.50); Whymper, "Chamonix and Mont Blanc" (Scribner, New York, $1.20); Whymper, "Travels amongst the Great Andes" (Scribner, New York, $2.50); Tarr, "Elementary Geology," Chapter XVII (McM., $1.40); Tarr, "Elementary Physical Geography," Chapter XIX (McM., $1.40); Shaler, "First Book in Geology," Chapter V (Heath, $0.60); Kingsley, "Madam How and Lady Why," Chapter V, "The Ice Plough" (McM., $0.50).

Sections IV and V. Valleys and Rivers. — Tarr, "Elementary Geology," Chapters VI–X; "Elementary Physical Geography," Chapters XV and XVI (each, McM., $1.40); Shaler, "First Book in Geology," Chapter VI (Heath, $0.60); Payne, "Geographical Nature Studies," sections on "Valleys," "Plants of the Valleys," and "Animals of the Valleys" (A. B. C., $0.25); Kingsley, "Madam How and Lady Why," Chapter I, "The Glen" (McM., $0.50); Frye, "Brooks and Brook Basins" (Ginn, $0.58); Lubbock, "The Beauties of Nature," Chapters VII and VIII (McM., $1.50). Poems: "The Brook," Tennyson; "The River," Samuel G. Goodrich; "The Mad River," Longfellow; "The Falls of Lodore," Southey; "The Brook and the Wave," Longfellow; "A Water Song," E. G. W. Rowe; "The Endless Story," A. K. Eggleston; "The Impatient River," E. G. W. Rowe; the last three in Payne, "Geographical Nature Studies" (A. B. C., $0.25).

Section VI. Ponds and Lakes. — Shaler, "First Book in Geology," pp. 125–129 (Heath, $0.60); Tarr, "Elementary Geology," pp. 188–193, and "Elementary Physical Geography," pp. 298–304 (each, McM., $1.40); Lubbock, "The Beauties of Nature," Chapter VIII (McM., $1.50); Payne, "Geographical Nature Studies," section on "Pools, Ponds, and Lakes" (A. B. C., $0.25); "The Lakeside," poem, by Whittier.

Section VII. The Ocean. — Shaler, "Sea and Land" (Scribner, New York, $2.50); Tarr, "First Book of Physical Geography," Part III (McM., $1.10); Lubbock, "The Beauties of Nature," Chapter IX (McM., $1.50); Andrews, "Stories Mother Nature Told Her Children," section on "Sea Life" (Ginn, $0.50); Holland, "The Sea Voyage," in "Arthur Bonnicastle"; Dickens, "David Copperfield," Chapter V; "Robinson Crusoe," Chapter III; Taylor, "The Waves," "Wind and Sea," in Marble's "Nature Pictures by American Poets" (McM., $1.25); Coleridge, "The Ancient Mariner."

Section VIII. The Air. — Tarr, "First Book of Physical Geography," Part II (McM., $1.10); "A Summer Shower," "Cornell Nature Study Bulletin," No. 1, June, 1899 (free on application to Cornell University, Ithaca, N.Y.); Murché, "Science Reader," Book III, sections on "Air," "Vapor in the Air," "Vapor: What becomes of It?" "What the Atmosphere Is," "Ice, Hail, and Snow" (McM., $0.40); Frye, "Brooks and Brook Basins," sections on "Forms of Water" and "The Atmosphere in Motion" (Ginn, $0.58); Strong,

"All the Year Round," Part II, sections 33–39 (Ginn, $0.30); Andrews, "Stories Mother Nature Told Her Children," section on "The Frost Giants" (Ginn, $0.50); Payne, "Geographical Nature Studies," many excellent stories and poems (A. B. C., $0.25); "Nature Pictures by American Poets": "Summer Shower," Dickinson; "Rain," De Land; "Song of the Snowflakes," Cheney; "Cloudland," Cheney (McM., $1.25); Wilson, "Nature Study in Elementary Schools," Second Reader, the following poems: "The Rain Shower," "The Wind Song," "The Bag of Winds," "The Sunbeams," "Snowflakes," "Signs of Rain," "The Rainbow" (McM., $0.35); Lovejoy, "Nature in Verse," the following poems: "Merry Rain," "The Clouds," "The Dew," "The Fog," "The Rain," "The Snow," "The Frost," "Jack Frost," "Little Snowflakes" (S. B. C., $0.60); Shelley, "The Cloud"; Whittier, "The Frost Spirit"; Bryant, "The Hurricane"; Whittier, "Snowbound"; Irving, "The Thunderstorm" (prose).

Section IX. Industry and Commerce. — Payne, "Geographical Nature Studies," sections on "Occupations," "Trade or Commerce," "Transportation by Land," "Transportation by Water" (A. B. C., $0.25); Andrews, "The Stories Mother Nature Told Her Children," section on "The Carrying Trade" (Ginn, $0.50); Whittier, "Songs of Labor."

Section X. The Government. — Brooks, "Century Book for Young Americans" (Century Co., New York, $1.50); Brooks, "The Story of the United States" (The Lothrop Publishing Co., Boston, $1.50); Payne, "Geographical Nature Studies," section on "Government" (A. B. C., $0.25).

Section XI. Maps. — Excellent outline maps of states and continents, costing 1½ to 2 cents each, can be purchased from D. C. Heath & Co., Boston, Rand, McNally, & Co., Chicago, and other publishers. Maltby, "Map Modeling" (A. S. Barnes & Co., New York, $1.00); Kellogg, "Geography by Map Drawing" (same publishers, $0.30); Redway, "The Reproduction of Geographical Forms" ($0.30) and "Teacher's Manual of Geography" ($0.65) (both by Heath); Frye, "The Child and Nature" (Ginn, $0.80); Frye, "Sand and Clay Modeling" (American Book Co., New York, $0.10); Frye, "Teacher's Manual of Methods in Geography" (Ginn, $0.50); Kellogg, "How to Teach Clay Modeling" (A. S. Barnes & Co., New York, $0.25); King, "The Picturesque Geographical Readers," First Book, Lesson XIII (Lee & Shepard, Boston, $0.50).

Part II

THE EARTH AS A WHOLE

I. FORM AND SIZE OF THE EARTH[1]

Its Form. — Hundreds of years ago, before America was discovered, men thought the earth was flat. They travelled so little that they had no idea of its form or of its size.

A few men who had studied the matter believed that the earth was a round ball, and that if one travelled straight on in any direction, he would in time return to the place from which he started. You can understand this by pushing your finger around on the outside of an orange, until it comes back to the starting-point.

Christopher Columbus believed this, and went to Spain, hoping to obtain money to secure ships for a long voyage to prove it.

Men were at that time in the habit of going to a land called India, for spices, silks, and jewels. To reach India from Spain they travelled thousands of miles *eastward;* but Columbus said that if the earth were round, like a ball, India might be reached by going *westward* across the ocean, and the distance would be much less. He therefore asked the king of Spain for ships and men to make such a journey.

The king refused the request, because the idea seemed ridiculous; but the queen came to his aid, and, at last, on August 3, 1492, he

[1] The use of a globe in this study is very important. Small globes may be obtained from dealers in school supplies at a very slight cost.

sailed westward on a voyage from which many thought he would never return; but, after a journey of several weeks, land was reached on October 12th.

Thinking he had reached India, he called the natives Indians; but instead of that he had discovered Cuba and other islands near the coast of North America; a continent and large ocean still lay between him and India. These newly discovered lands became known as the *New World*, to distinguish them from the *Old World*, where all white men then lived.

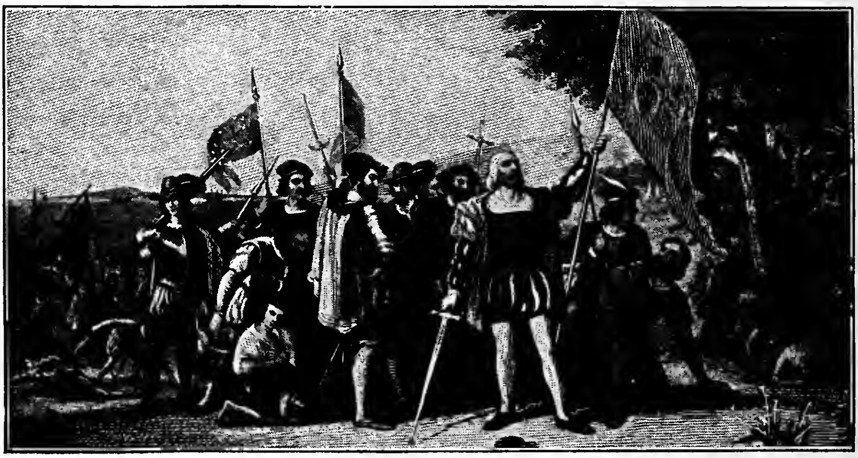


FIG. 92.

Columbus landing in America and taking possession of it in the name of the king of Spain.

After Columbus returned in safety, other men dared to explore the New World. One of them, named Magellan, started to sail round the earth ; and though he was killed when he had reached the Philippine Islands, his ships went on and completed the journey. Since then many people have made the voyage in various directions, and the earth has been studied so carefully that every one now knows it is round.

The great, round earth is also called the *globe* or *sphere*

The reason that it does not seem round to us, is that we see so little of it at a time.

If you see very little of an orange, it will not look round either. To prove this, place upon an orange a piece of paper with a small hole in it, so that none of the surface is seen excepting that which shows through the hole. This part does not appear round, but flat.

FIG. 93.
The sphere.

If we could get far enough away from the earth to see a large part of it at once, as we are when looking at an orange, or at the moon, we would easily be able to observe its roundness (Fig. 93).

Size of the Earth. — Our sphere is so large that even the highest mountains, when compared to the whole earth, are no larger than a speck of dust when compared to an apple. Lofty mountains are rarely more than three or four miles high; but the *diameter* of the earth, or the distance from one side to the other, through the *centre of the earth*, is nearly eight thousand miles.

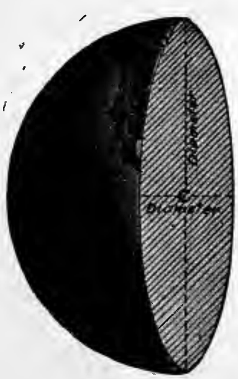


FIG. 94.

Figure of the earth cut in two, to show the diameter, the line passing through the centre (*c*).

The *circumference* of the earth, or the distance around the outside of it, is about twenty-five thousand miles. This is a little more than three times the diameter, and you will find that the circumference of any sphere is always a little more than three times its diameter. Prove this with an orange.

Review Questions. — (1) What did people formerly know about the shape of the earth? (2) What is its form? (3) Tell the story of Columbus. (4) Why did he call the savages Indians? (5) Why was the land he discovered called the New World? (6) Tell about Magellan's voyage. (7) Explain why the earth does not appear to us to be a sphere. (8) What is the diameter of the earth? The circumference? (9) The latter is how many times the former?

Suggestions. — (1) Read something about the life of Columbus. (2) Read about Magellan. (3) Find the names of some other early explorers and read about them. (4) Trace Columbus's journey on a globe to see where he actually went. Find India in order to see where he thought he had gone, and notice how one can go to India by travelling eastward as well as westward. (5) Make a sphere in clay. Measure its diameter with a needle. (6) How many proofs can you find that the earth is round? Find out how we know that it is like a ball and not like a cylinder. (7) Write a story about Columbus. (8) Trace on a globe the route followed by our soldiers who went to the Philippines; of Admiral Dewey when he returned by way of the Mediterranean. How many days are required for such a journey? (9) Obtain a telescope or an opera glass and look through it at the moon.

For References, see page 257.

II. DAILY MOTION OF THE EARTH, AND ITS RESULTS

The Axis and Poles. — The earth seems to us to be motionless, while *the sun appears to move* round it each day, rising in the east and setting in the west. But in reality neither of these things happens.

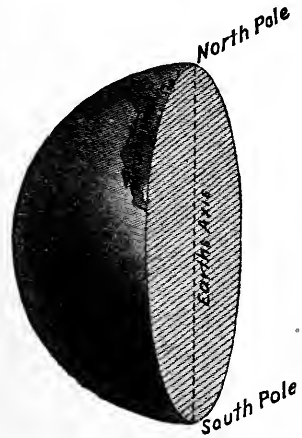


FIG. 95.
A drawing of the earth cut through to show the axis and poles.

Instead of being without motion, the earth is turning round at a uniform rate of speed. You have perhaps watched a wheel spin about on a rod or pin, and have noticed that the outside goes rapidly, while the part near the pin moves much more slowly. It is the same with the earth; and just as we speak of the wheel turning upon a pin, so we speak of the earth turning upon its *axis*.

But the axis of a wheel is something real, while the axis of the earth is merely *a line that we think of* as reaching through the earth's centre and extending to the surface in both directions.

The two ends of this axis are called the *poles of the earth*, one end being the *north pole*, the other the *south pole*.

Allowing an apple to represent the earth, a knitting needle or a stick pushed through its centre would represent its axis, and the two

ends on the surface, the two poles. You can then spin the apple, very much as the earth spins (Fig. 97).

If you were to go directly north from the place where you live, you would in time come to the north pole; or, if far enough south, to the south pole. Many men have tried to cross the icy seas (Fig. 100) that surround the north pole. If one ever reaches that point, he will not find a pole; but the north star, toward which the axis points, will be almost directly overhead.

The Equator. — Midway between these poles, we think of another line drawn around the earth on the outside. This is called the *equator*, because all parts of it are *equally* distant from each of the poles. On page 113 the distance around the earth was given; what, then, is the length of the equator?

Fig. 96.

A drawing of that half of the sphere containing the New World, — to show the position of the poles and the equator.

As the earth spins on its axis, all points on the surface must go with it, as every part of the skin of an apple turns with it. Since the earth makes one complete turn each day, a man at the equator travels twenty-five thousand miles every twenty-four hours. What a whirling motion that is! It is at the rate of over one thousand miles an hour, while the fastest trains run little more than sixty miles an hour.

Why do not places considerably north or south of the equator move as rapidly as those at the equator?

Gravity. — What, then, is to hinder our flying away from the earth, just as, when a stone is whirled about on a string, it flies away the moment the string breaks? And why is not all the water hurled from the ocean?

The reason is that the earth draws everything toward it. If you push a book from your desk, it falls to the floor; and when you spring into the air, you quickly return to the ground. All objects are drawn *downward*, because the earth is pulling upon them. It attracts them much as a horseshoe magnet attracts pieces of iron.

The force with which the earth draws all objects toward it is called *gravity;* and it is because of gravity that the water, trees, houses, and we ourselves, do not fly off when the earth is turning at such a tremendous speed.

Sunrise and Sunset. — The sun *seems* to rise in the east and set in the west. This could not be the case if the earth did not turn or *rotate* toward the east; for all heavenly bodies must first appear in the direction toward which the earth turns. This eastward rotation of the earth, therefore, explains why the sun seems to rise and set as it does.

Hundreds of years ago people thought that the sun actually rose, and, after moving across the heavens, set in the west. We still use the words "sunrise" and "sunset" which they used, although we know that the sun *appears* to rise only because the earth rotates.

Day and Night. — It is this rotation that causes day and night. A lamp can light only one-half of a ball at a time, as you know. So the sun can light only half of the great earth ball at one time. This being the case, if our globe stood perfectly still, there would always be day on the half next to the sun, and night on the other half.

But since the earth rotates, the place where it is day is constantly changing; and while the sun is setting for people far to the east of us, it is rising for those far to the west. When it is noon where you live, it is midnight on the other side of the earth. Thus each place has its

period of daylight and darkness; and as the earth makes one complete rotation every twenty-four hours, the day and night together must last just that length of time.

Fig. 97.

An apple lighted by a candle on one side, to illustrate the cause of day and night.

Review Questions. — (1) What motion has the earth? (2) What is the axis of the earth? (3) The north pole? The south pole? (4) Represent the axis and poles by using an apple. (5) Walk toward the north pole. Toward the south pole. (6) What is the equator? (7) How long does it require for the earth to turn completely around once? (8) What rate of travel is that, for a point upon the equator? (9) Why are we not thrown away from the earth? (10) Give several examples showing what is meant by gravity. (11) In what direction is the earth rotating? (12) How does that explain sunrise and sunset? (13) What causes night? (14) What would be the result if the earth did not rotate? (15) When it is noon here, what time is it on the other side of the earth? (16) How long must the day and night together last? Why?

SUGGESTIONS. — (1) Point out the axis of a wheel; of a top; of a rotating ball; of a spinning globe. (2) Mark the two poles on an apple or ball, and then draw a line for the equator. (3) Mould a sphere in clay, and show the poles and the equator. Cut it in half, and mark a line for the axis. (4) Find exactly how many miles a point on the equator moves each hour. (5) Use a horseshoe magnet to attract pieces of iron. (6) Use a globe, or apple, and a lamp to show why the sun appears to rise and set, and why it is day on one side while it is night on the other. (7) Watch the stars in the east some night, to see which way they appear to move. (8) Why do not the clouds appear to move westward also? (9) Is the sun always shining during the day? Why, then, do we not always see it? (10) Who was Atlas? Who was Aurora? (11) Find out what the ancients supposed became of the sun each night. (12) When it is noon here, what time is it one-fourth of the distance around the earth to the east? To the west?

For REFERENCES, see page 258.

III. THE ZONES

Boundaries of the Zones. — The sun's rays feel warmer at noon than in the early evening because the sun is more nearly overhead at noon, and the rays then reach us nearly vertically.

FIG. 98.

A map of the zones. The colors suggest *sharp* differences between the zones on the two sides of the boundaries; but you should remember that the changes are *very gradual.*

For the same reason the sun seems hotter in summer than in winter, and in some parts of the earth than in others.

The hottest part of the earth is near the equator, for in that region the sun at midday is directly over the heads of the people. That is the case, for a part of the year, as far north as the line on the map (Fig. 98) marked *tropic of Cancer*, and as far south as the one marked *tropic of Capricorn.* Point to them on Figs. 119 and 120. These lines are more than three thousand miles apart, a distance greater than that across the United States from Boston to San Francisco; and over that vast area the heat is intense, or *torrid.* Those who live there wear only the very lightest clothing, and the savages have almost none (Fig. 99).

But further north and south the heat becomes less and

less intense, because the rays of the sun, even at noon, approach the earth at a greater slant. There is a region, then, on each side of this broad hot belt, where it is neither very hot nor very cold, but *temperate.*

Finally, near the poles, the rays are very slanting, as they are in our early morning or late afternoon. There it is so cold, or *frigid*, that the ground never thaws out, the ice never entirely disappears, and very little vegetation can grow.

Torrid Zone. — Thus one part of the earth has a hot climate. There the noonday sun is always so directly over the heads of the inhabitants that they never have winter.

This hot region extends entirely around the earth, like a great belt, and the equator is in the middle of it. This is called the *tropical belt*, or the *tropical* or *torrid zone*, and sometimes the *equatorial belt.* Why the latter name?

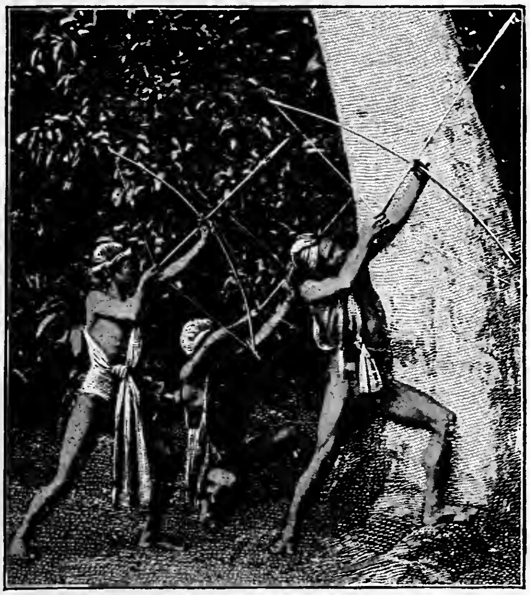


Fig. 99.

Philippine savages hunting; their home is in the torrid zone, and they need almost no clothing.

Temperate Zones. — On the north and south sides of this are the two temperate zones. People living in the *north temperate zone* find the sun to the south of them at noon, even in summer; and their shadows always

fall toward the north. But in the *south temperate zone* the midday sun is always in the north. Which way must the shadows fall in that zone?

Notice the position of the sun at midday where you live, and also the direction and length of your shadow at that time. In which of the temperate zones do you live?

FIG. 100.
Cape York Eskimos, Greenland, in their summer dress, standing by their sleds on the ice-covered sea.

Frigid Zones. — North of the north temperate zone, and south of the south temperate, are the *frigid zones*, where the sun is never high in the heavens, but even at midday is near the *horizon*. There the shadows are very long, as they are with us in the late afternoon. In consequence, while at the equator there is never any winter, near the poles there is never any real summer weather.

The northern of these zones is called the *north frigid*

zone (Fig. 100); the southern, the *south frigid zone.* They are also known as the *polar zones*, since they surround the poles.

It is so cold that no one has ever been able to reach either of the poles. These are surrounded by miles and miles of snow and ice, and vessels hundreds of miles away from them are in danger of being crushed by ice, or held by it so that they cannot move.

Hemispheres. — The half of our sphere north of the equator is called the *northern hemisphere* (or half sphere), the southern half, the *southern hemisphere.* The earth is also divided into halves by a circle running north and south through both poles, the western half, containing the New World, being called the *western hemisphere*, and the eastern half, containing the Old World, the *eastern hemisphere.*

Review Questions. — (1) What is the cause for the great heat in the torrid zone? (2) What are its boundaries? (3) What other zones are there? What are their boundaries? (4) In which direction does the midday sun lie in each zone? (5) In which direction do the shadows then fall? (6) Why should the heat grow less, the farther one travels from the equator? (7) Why has no one ever been able to reach either pole? (8) Which part of the earth has no cold weather? (9) Which part has no hot weather? (10) Point out the zones in Figure 98. (11) Represent them in a drawing of your own. (12) Name the hemispheres and tell where each is.

Suggestions. — (1) Find out more about the reason why the sun's rays are hotter when the sun is overhead than when it is low in the heavens. (2) Write a story telling about the changes in clothing you would need to make in passing from the north to the south pole. (3) In which direction would you look to see the sun at noon on such a journey? (4) How might the changes in heat affect the growth of trees and other plants? (5) How would the direction of your shadow change? Its length? (6) If there were no watches or clocks, how could you tell the time of day from the sun? (7) Find out about some of the men who have tried to reach the north pole. (8) In which zone should you prefer to live? Why? (9) Explain how some places in the temperate zone are warmer than some in the torrid zone.

For References, see page 258.

IV. HEAT WITHIN THE EARTH, AND ITS EFFECTS

Heat in Mines. — While much is known about the surface of the earth, very little is certain about its interior. The reason for this is that people cannot go far down below the surface in order to see what is there.

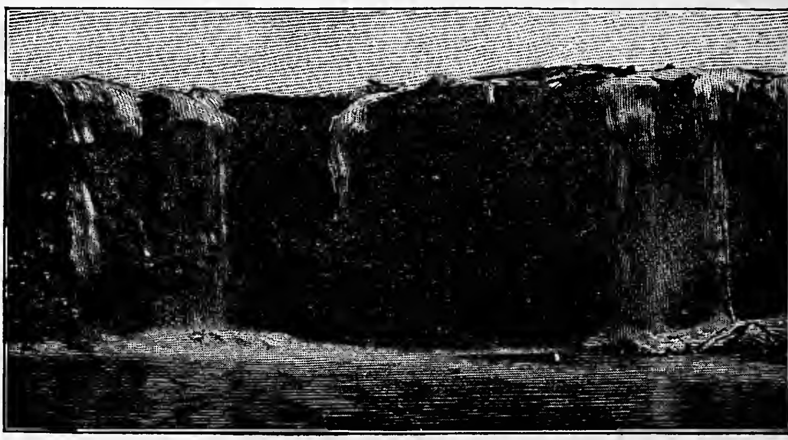


Fig. 101.

Melted rock, from a volcano in the Hawaiian Islands, flowing over the face of a precipice into the water.

In some places there are mines reaching fully a mile below the surface. This may seem a great depth; but when it is remembered that it would be necessary to go four thousand times as far to reach the centre, it is plain that this is really a short distance. A mile below the surface of the earth is not so much as the thickness of the skin of an apple, compared with the thickness of the apple itself.

In all of these mines, and in many deep wells, men find solid rock, usually covered at the surface with soil; but no one has ever gone beyond this rock.

It is interesting to note that the farther miners have dug down into the earth, the warmer they have found it. The thermometer rises about one degree for every fifty or sixty feet, and some mines, as they have been deepened, have become so hot that men could no longer work in them.

Melted Rock. — This has led to the belief that, if it were possible to go still deeper, the earth would be found to grow hotter and hotter, until, several miles below the surface, it might be hot enough to melt rocks.

Another fact leading to the same belief is that, in some regions, melted rock, called *lava*, actually flows out of the earth, and then cools to form solid rock (Fig. 101). In some places so much lava has flowed forth at different times, and collected about the opening called the *crater*, that a mountain peak has been built. Such peaks are called *volcanoes* (Fig. 102), and some of them are many thousand feet high.

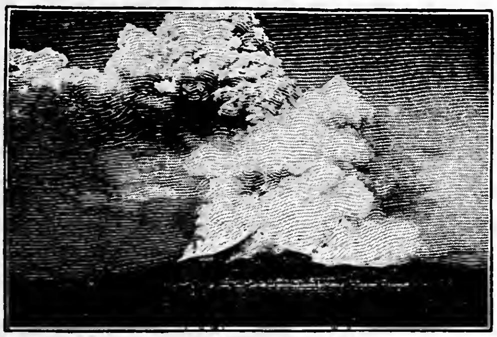


Fig. 102.
Vesuvius, in Italy, sending out lava, ashes, and steam during an eruption some years ago.

The Earth's Crust. — From a study of the earth it seems certain that, although the outside is now cold, it was once hot, and that the mass within is still hot. It may be compared to a biscuit that is still hot inside, although its crust has become cool. In fact, this cold outside part of the earth is generally called the *earth's crust.*

Cause of Mountains. — It was stated on page 19 that some parts of the earth have been raised to form mountain

ranges, while others have been lowered to form valleys. We are now ready to explain how this has happened.

You have, perhaps, seen a blacksmith put a tire upon a wheel. He heats the tire so hot that it expands, and it is then easily placed over the wheel. But when the iron cools it shrinks, so that the tire then fits the wheel tightly.

FIG. 103.

An apple wrinkled through drying.

The hot interior of the earth is undergoing a similar change, since every year it is slowly growing cooler, and, therefore, shrinking or *contracting*. This allows the cool crust to settle; but, being too large, it wrinkles, or puckers, causing the rocks to bend and break, and forming great mountain ranges and valleys.

One sees something of the same kind in an apple that has become dry and wrinkled (Fig. 103). It has dried because some of the water beneath the tough skin has gone into the air as vapor; thus the inside has been made smaller. The skin of the apple, like the crust of the earth, has then settled down and become wrinkled.

Cause of Continents and Ocean Basins.—The mountains and valleys are not the largest wrinkles on the earth's surface. As the crust has settled, some portions have been lowered several miles further than others, and in these great depressions the waters have collected, forming the *oceans*, which in places are four or five miles deep.

Those great portions of the earth's crust which rise above the ocean are called *continents;* and the highest mountain peak upon them is fully eleven miles above the deepest part of the ocean.

Change in the Level of the Land.—The contracting of the earth has caused many changes, and is still causing them. Some parts of

the land have risen out of the ocean, and other parts have sunk beneath it. Perhaps the place where you live, even though it be among the mountains, was once below the ocean. This can be proved, in some places, by finding certain shells, called *fossils*, in the rocks.

FIG. 104.
A rock containing many fossil shells.

Ages ago these shells were parts of animals living in the ocean; but on the death of their owners they became buried in the mud and lay there for centuries until the layers of mud became slowly hardened into rock. This was later lifted above the water, and then frost, rain, and rivers wore the upper layers away, bringing the fossils to light.

We have already seen (p. 2) how rock is changing to soil and being washed from the land into the ocean. We now learn that this settles upon the ocean bottom, hardens into rock, and then, perhaps, is lifted into the air. These changes are very slow, but they are going on all the time. Places once inhabited by men are now beneath the sea, and others where they now live have risen above it.

REVIEW QUESTIONS. — (1) What is known about the temperature of the earth below the surface? (2) What does that suggest? (3) What other proof of this conclusion is there? (4) What is a volcano? (5) What is the crust of the earth? (6) What happens as the interior cools? (7) Compare this with the drying of an apple. (8) How have the ocean basins and continents been formed? (9) What do fossils in the rocks prove?

SUGGESTIONS. — (1) Collect pictures of volcanoes. Of earthquakes. Read about some volcanic eruption. (2) Make a drawing of a volcano. (3) Dry an apple and notice the change. (4) Not all rocks contain fossils; but examine those in your section to find if they do. (5) If you live near a beach, notice how shells are covered by the sands. (6) If a mine were a mile deep, what would be the temperature at the bottom, if the average temperature at the surface is 45°.

FOR REFERENCES, see page 258.

FIG. 105. — Land (on left-hand side) and water (on right-hand side) hemispheres. *Hemisphere* means half sphere; that is, half the earth.

V. THE CONTINENTS AND OCEANS

Land and Water. — The greater part of the land is found in the northern hemisphere, the greater part of the water in the southern (Figs. 106 and 112).

FIG. 106. — The northern hemisphere, showing the land about the north pole, Eurasia in the eastern hemisphere, and America in the western.

It is possible to divide the earth into halves, in one of which — the *land hemisphere* — nearly all the land is situated, while in the other — the *water hemisphere* — there is very little land. This is shown in Fig. 105.

The Continents

In Fig. 106, or, better, on a globe, notice that two great masses of land extend from the north polar zone. One of these lies in the western hemisphere, and is the land on which we live; the other is in the eastern hemisphere.

North America. — The western land, which is better shown in Fig. 107, is broad near the north pole, and tapers down nearly to a point just north of the equator, having the form of a triangle. What is the name of this part?

Show where New York, Washington, and Chicago should be on this map. (See the map, Fig. 120.) Point also to your home. Find some rivers, mountains, peninsulas, gulfs, and other forms of land and water.

Fig. 107.
The half of the sphere containing the New World.

South America. — South of North America, and connected with it by a long neck of land, the Isthmus of Panama, lies the continent of *South America.* The two continents together are called the two Americas, forming the New World which Columbus discovered (p. 111). Notice how much alike they are in shape; draw triangles to show this.

Through what zones does North America extend? (See Fig. 98, p. 120.) South America? Point to the places where there is snow all the time; to the part where there is never any snow. Where must the Eskimo girl, Agoonack, one of the Seven Little Sisters, have lived? Read about the Eskimos on page 192.

Tell how the climate would change if you were to travel from the northern end of North America to the southern end of South America. What changes would you expect to find in the plants? In the clothing of people? Write a story about such a journey.

On the opposite page are pictures of some of the wild animals of South America (Fig. 109). What wild animals live in North America? Collect pictures of them. Have you ever seen any of them?

Eurasia.—East of us, across the Atlantic Ocean, is the Old World (Figs. 108 and 113). More land is found

Fig. 108. — A hemisphere showing a part of Eurasia and Africa.

Fig. 109.
Some of the animals of South America.

there than in the New World, and the largest mass of it is called *Eurasia.*

The northern part of Eurasia is in the North Frigid zone, on the opposite side of the north pole from North America (Fig. 106), and extends a great distance east and west. Find for yourself how far south it reaches, and through what zones it passes.

Long ago, before Columbus made his voyage to the New World, the most civilized people lived in *Europe*, the western part of that great continent.

The homes of Jeannette and Louise, two of the Seven Little Sisters, were in that country. If you have read the story, can you not tell something about each of them?

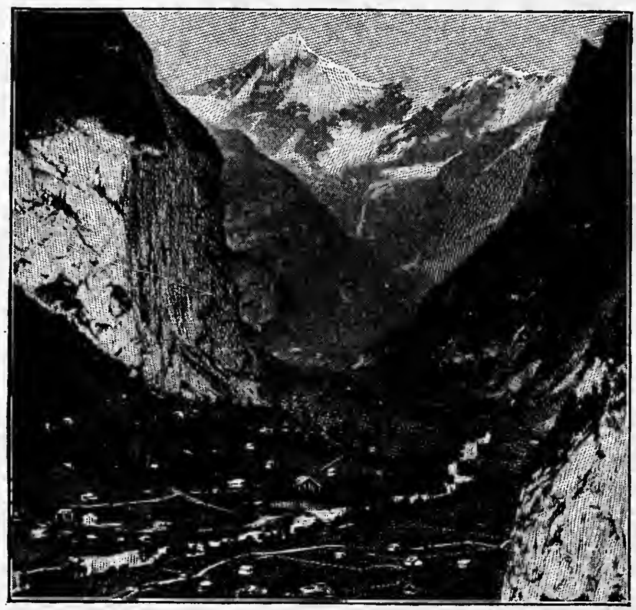


Fig. 110.

The home of Jeannette among the Swiss mountains. Find other pictures of these mountains on pages 18 and 23.

The eastern part of the continent is called *Asia.*

Read in the "Seven Little Sisters" about Gemila, the child of the desert, and of Pen-se, the Chinese girl, whose homes were in Asia.

Europe is usually considered one continent and Asia another, although, as you can see from the maps, especially Fig. 106, they are not

so clearly separated as the other continents are. For this reason Europe and Asia are often called one continent, Eurasia, the name being made up of "Eur," from Europe, and "Asia."

Point toward this continent. Walk toward it. Which is probably its warmest part?

Africa. — South of Europe is the continent of Africa.

Here lived the little dark girl, Manenko, one of the Seven Sisters, and this is the place the negroes came from.

Fig. 111.
The tiger, one of the wild animals of Africa and Asia.

In what zones does Africa lie? How does it compare with South America in temperature? In shape? In what direction would you start in order to go directly to Africa?

Australia. — South of Asia are many large islands called the East India Islands (Fig. 120). Find the zone in which they lie. Southeast of these is a large island known as the continent of *Australia* (Fig. 119). In what zones is it?

THE OCEANS

The Arctic and Antarctic. — There seems to be a great deal of land; but, as we have learned (p. 63), three-fourths of the earth is covered by ocean water. The water around the north pole (Fig. 106) is called the *Arctic Ocean*. Find it on a globe.

There are many islands in this ocean, and the water between them is covered with ice. The climate is so cold that there are very few people, and no crops of any kind can be raised. Here the Eskimos live, hunting the polar bear, seal, and walrus to obtain meat for food, fur for clothing, and oil for fuel and light (see p. 192).

Much less is known about the *Antarctic Ocean* (Fig. 112), which surrounds the south pole, and in which there is also a great deal of floating ice.

The Atlantic. — Extending from the Arctic to the Antarctic is the *Atlantic Ocean*, having the Old World on the east and the New World on the west. This is the water that we cross in going to Europe, and many of the things we eat and wear are brought across it. Can you name some of them? Find what continents the Atlantic bathes.

The Pacific. — The water west of North America is called the *Pacific Ocean*, which is the largest of all oceans, occupying more than one-third of the earth's surface. What continents does it bathe? Walk toward it.

The Indian. — There is still another great body of water called the *Indian Ocean* (Fig. 108). It lies south of India in Asia, and between Africa on one side and Australia and the East Indies on the other.

The Ocean Bottom. — The depth of the ocean water varies considerably; on the average it is a little over two

miles, but in some places it is more than four miles deep. In this immense body of water are millions of animals, some of them, as the whale, shark, codfish, and seal, being of use to man.

The bed of the ocean is mainly a great plain, where it is as dark as our darkest night, because the sunlight cannot pass through so much water. In consequence, the fish living there have little use for eyes, and some have none.

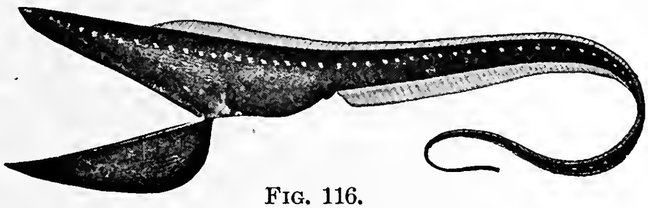


FIG. 116.
One of the deep-sea fish.

The mud which covers the bottom is in many places made up of the shells of tiny animals, many of them even smaller than a pinhead. Some of the chalk used in schools was just such mud before it was raised to form rock layers on the dry land.

Mountains in the Oceans. — While most of the bottom of the sea is a plain, some parts are not so level. Here and there are mountain peaks, and chains of islands, extending above the sea far away from the continents. Many of these are portions of mountain chains rising above the water; but many, like the Hawaiian Islands, are volcanoes which have been built up by lava flowing from the interior of the earth (p. 125).

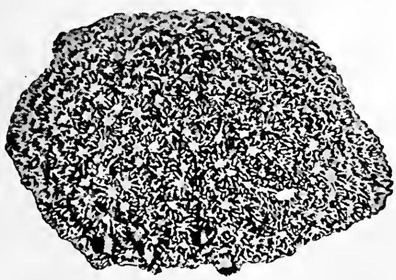


FIG. 117.
A piece of coral, with the polyps projecting from the hard coral like a bunch of flowers.

Fig. 112.

The southern hemisphere, showing the water surrounding the south pole. Notice that the Antarctic is not separated by land from the other oceans.

NORTH POLE

SOUTH POLE

Fig. 113.

The Atlantic Ocean.

NORTH POLE

SOUTH POLE

Fig. 114.

The eastern part of the Pacific Ocean.

NORTH POLE

SOUTH POLE

Fig. 115.

A part of the globe. What continents and oceans are shown ?

Coral Islands. — In the open ocean there is another interesting kind of island known as the *coral island* (Fig. 118). Some very tiny creatures, called *coral polyps*, build hard, limy coral, such as you have no doubt seen. Where the ocean water is warm, as in the torrid zone, these little animals live in immense numbers, millions of them around a single island.

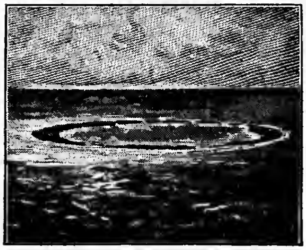


FIG. 118.
A ring-like coral island, called an *atoll*, in the open ocean.

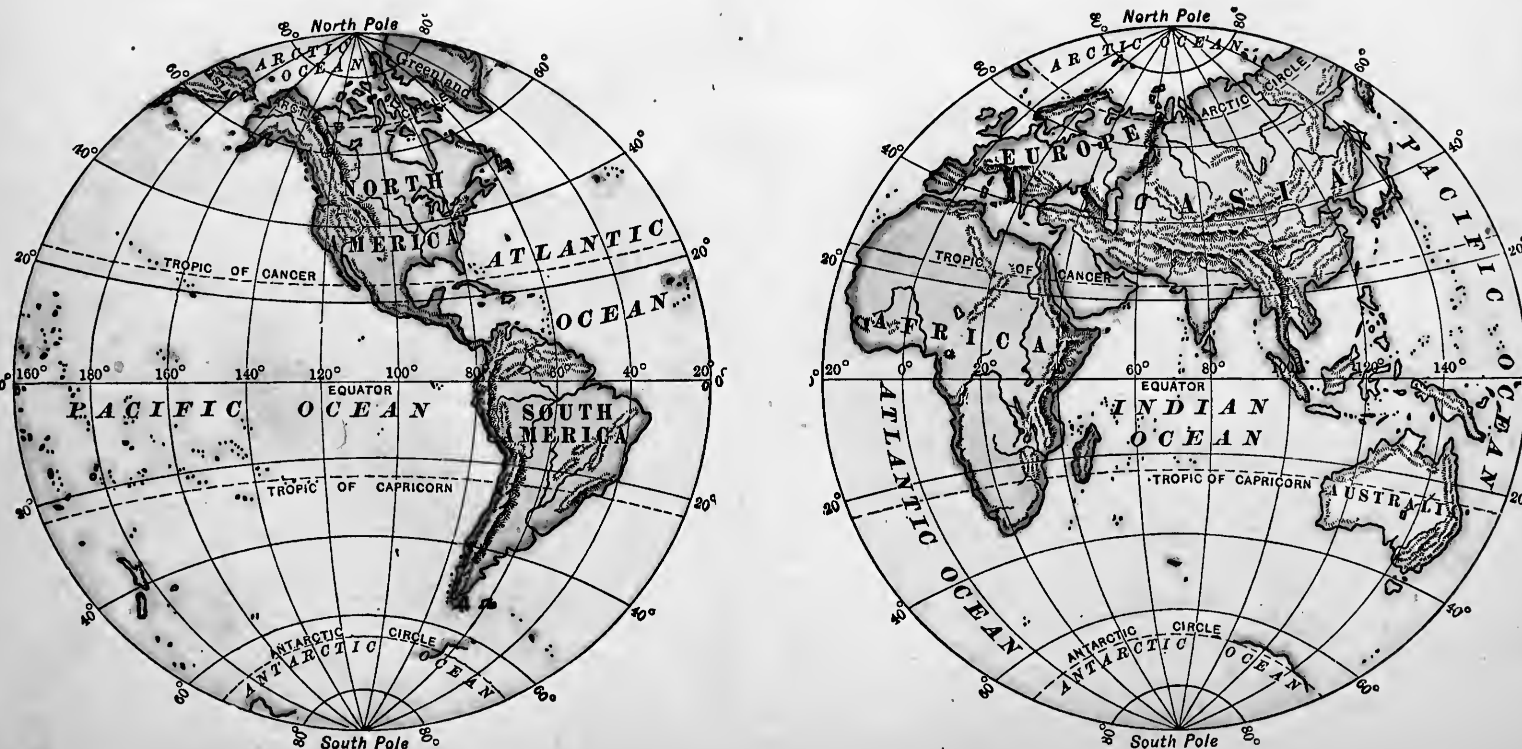
Each polyp resembles a fully blossomed flower; and they vary greatly in color, being white, pink, purple, red, yellow, brown, and many other colors. It is a truly beautiful sight to see them spread out in the water, looking like a flower garden in the sea (Fig. 117).

When these coral animals die, the hard coral part remains. Then other polyps build upon these skeletons, and this is continued until the surface of the water is reached and coral islands are formed.

REVIEW QUESTIONS. — (1) Name the five continents, counting Eurasia as one. (2) Write their names. (3) Walk toward each of them. (4) Tell what you can about each. (5) Where is the Arctic Ocean? The Antarctic? (6) Tell something about the people and animals of the Arctic region. (7) What oceans touch North America? (8) Name five oceans. Which is the largest? (9) What are the conditions on the ocean bottom? (10) In what ways are islands in the open ocean formed? (11) How are coral islands made?

SUGGESTIONS. — (1) Make an outline drawing of each of the continents. (2) Of each ocean. (3) Collect pictures of the animals, people, and scenery of the continents. (4) Write a story about one of the pictures. (5) Obtain pieces of coral for the school collection.

For REFERENCES, see page 258.


North Pole
ARCTIC OCEAN
Greenland
NORTH AMERICA
ATLANTIC OCEAN
TROPIC OF CANCER
EQUATOR
PACIFIC OCEAN
SOUTH AMERICA
TROPIC OF CAPRICORN
ANTARCTIC CIRCLE
ANTARCTIC OCEAN
South Pole
North Pole
ARCTIC OCEAN
ARCTIC CIRCLE
EUROPE
ASIA
PACIFIC OCEAN
TROPIC OF CANCER
AFRICA
EQUATOR
INDIAN OCEAN
ATLANTIC OCEAN
TROPIC OF CAPRICORN
AUSTRALIA
ANTARCTIC CIRCLE
ANTARCTIC OCEAN
South Pole

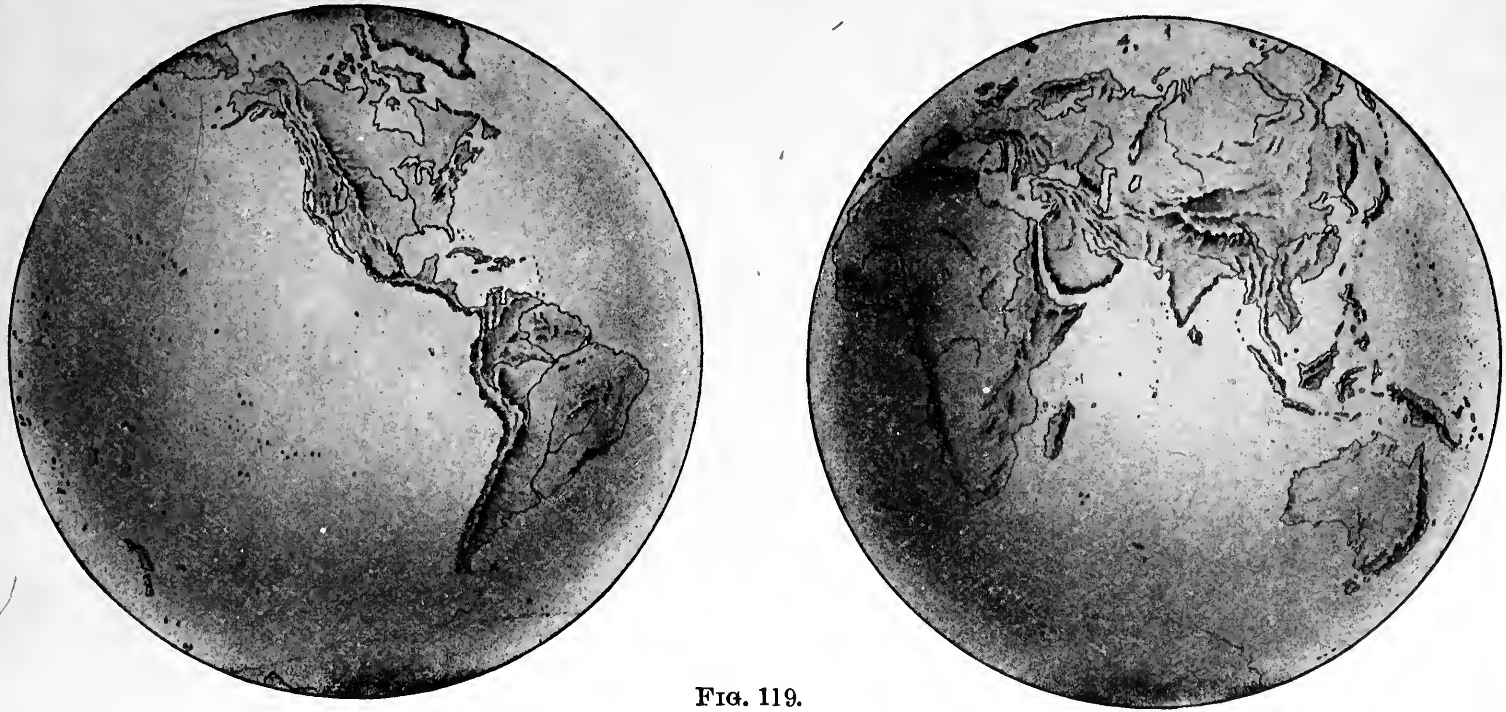


FIG. 119.

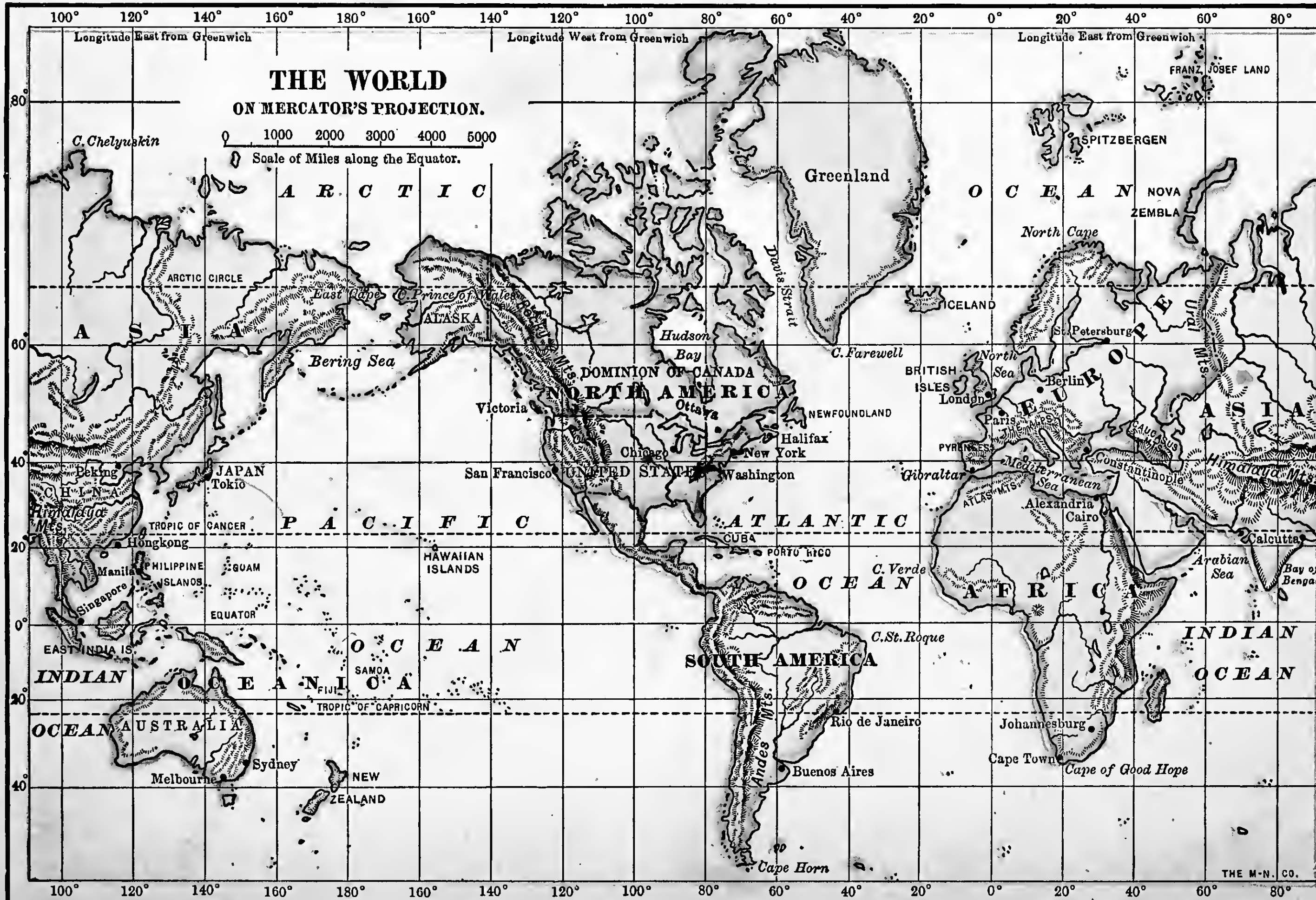

THE WORLD
ON MERCATOR'S PROJECTION.
0 1000 2000 3000 4000 5000
Scale of Miles along the Equator.
Longitude East from Greenwich
Longitude West from Greenwich
Longitude East from Greenwich
C. Chelyuskin
ARCTIC OCEAN
ARCTIC CIRCLE
ASIA
PACIFIC OCEAN
ATLANTIC OCEAN
INDIAN OCEAN
OCEANICA
TROPIC OF CANCER
EQUATOR
TROPIC OF CAPRICORN
Greenland
Davis Strait
C. Farewell
ICELAND
SPITZBERGEN
FRANZ JOSEF LAND
NOVA ZEMBLA
North Cape
St. Petersburg
EUROPE
Ural Mts.
BRITISH ISLES
London
North Sea
Paris
Berlin
PYRENEES
Gibraltar
Mediterranean Sea
ATLAS MTS.
Alexandria
Cairo
Constantinople
Caucasus
Himalaya Mts.
Calcutta
Arabian Sea
Bay of Bengal
AFRICA
Johannesburg
Cape Town
Cape of Good Hope
East Cape
C. Prince of Wales
ALASKA
Bering Sea
Hudson Bay
DOMINION OF CANADA
NORTH AMERICA
Ottawa
Victoria
NEWFOUNDLAND
Halifax
New York
Chicago
UNITED STATES
Washington
San Francisco
CUBA
PORTO RICO
C. Verde
C. St. Roque
SOUTH AMERICA
Andes Mts.
Rio de Janeiro
Buenos Aires
Cape Horn
HAWAIIAN ISLANDS
SAMOA
FIJI
NEW ZEALAND
AUSTRALIA
Sydney
Melbourne
EAST INDIA IS.
PHILIPPINE ISLANDS
GUAM
Manila
Singapore
Hongkong
JAPAN
Tokio
Peking
CHINA
Himalaya Mts.
THE M-N. CO.

FIG. 120.

VI. MAPS

THE maps that have been thus far used are all hemispheres, and represent the earth as it would appear if we looked down upon it from above. Such maps are especially desirable because they call attention to the roundness of the earth; but they are so difficult to make that it is customary to represent the earth on flat maps instead.

In Fig. 119 you can see the difference between the two. While the lower ones show the roundness of the earth, the upper two represent it as quite flat. Although they are unlike, the latter show the position of the land and the water quite as plainly as the former. Since this is true, and since it is much easier to make the flat maps, these will be the ones chiefly used hereafter in this book. But in studying flat maps one should always remember to think of the earth as round, and not as a flat surface.[1] It should also be noticed that on flat maps it is impossible to show correctly both the shape and the size of countries. Compare Greenland and South America in Fig. 119 with the same countries in Fig. 120. If you should draw a picture on half of a toy balloon made of rubber, and then stretch the rubber flat, would the picture look the same? Examine Fig. 120 also.[2]

[1] The teacher should see that this is done by frequent use of a globe. It is advisable to have one large globe and several small ones, so that each pupil may have one for frequent use.

[2] These maps (Figs. 119 and 120) should be carefully studied, the pupil following map questions given by the teacher to cover form, location, etc., of continents, oceans, and important places.

Fig. 121.
Relief map of North America.
(Modelled by E. E. Howell.)

VII. NORTH AMERICA

Physical Geography. — Here is a relief map of the continent on which we live. What great highland do you find in the west? In the east? In what direction does each extend? Which is the broader and higher? Where is the lowest land between these two highlands? Trace the Mississippi River. Name some of its largest tributaries. (You will find these rivers on the map, Fig. 123.) Find the Rio Grande River in the south, the St. Lawrence River in the northeast; the Yukon in the northwest. What two great rivers flow westward from the Rocky Mountains to the Pacific Ocean?

Notice the slope east of the Appalachian Mountains. Is it longer or shorter than that west of the Rockies? What, then, are the main slopes in North America? Upon which of these slopes do you live? Point as nearly as you can to the place where your home is.

FIG. 122.

Section across United States, from east to west, to show mountains, plains, and principal slopes.

Find New York and San Francisco on Fig. 123. If you were to go westward from the former to the latter, you would travel over many hills, valleys, and mountains. Some of the slopes would be short and gentle; others would be very long, and sometimes gentle, sometimes steep. Here is a drawing showing the chief slopes you would cross in making that journey. Point on Fig. 121 to the slopes *A*, *B*, *C*, *D*, *E*, and *F*, of the drawing. Draw a section like this.

Political Divisions. — You will remember that Spain was the nation that helped Columbus make his discovery of America. The Spaniards afterward settled in the southern part of the continent, and introduced the Spanish language there. That is still the chief language spoken in *Mexico*, in the southern part of North America. Mexico became independent of Spain many years ago.

Other nations also sent explorers and made settlements. Among these were the English, who settled chiefly along the Atlantic coast, and finally came to own the greater part of the continent north of Mexico.

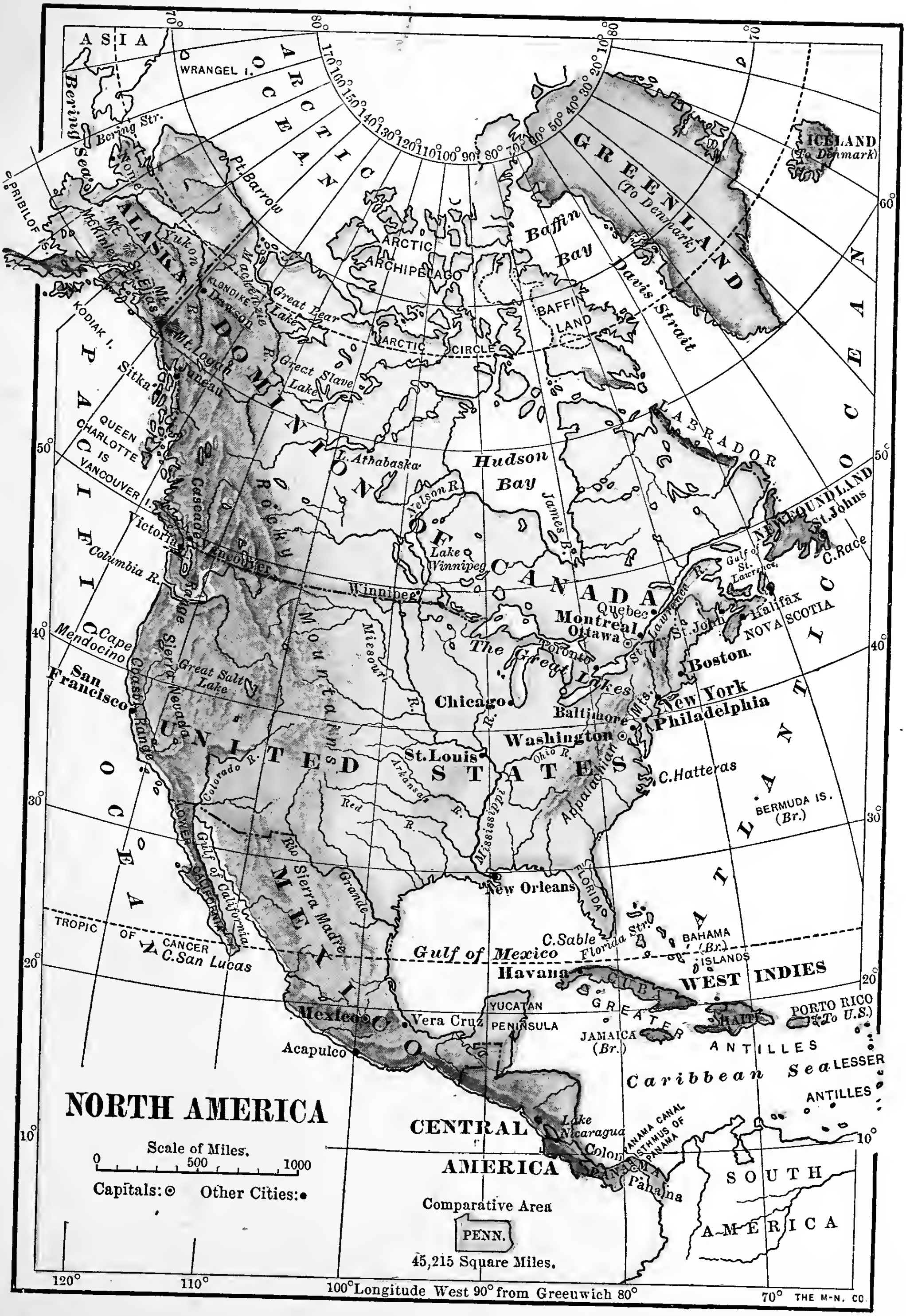
In time the English who lived in the central portion of eastern North America waged war against England, and chose George Washington as their leader. On the 4th of July, 1776, they declared their independence of England, and finally won it completely. This part became known as the *United States;* but the region to the north, which England was able to keep, and which she still possesses, is called *Canada*. Find each of these countries on the map (Fig. 123). Point toward Canada and Mexico.

Besides these three large nations, several smaller ones occupy *Central America*, which lies south of Mexico.

Of course there must be some place where one country ends and another begins. Such a place is called a *boundary*, and the boundary lines between the different nations are shown on this map by heavy lines. Point them out.

In some parts you see that a *natural boundary* has been chosen, such as a river or a chain of lakes; but it is often only a straight line, cutting across rivers, lakes, and mountains. Examine the boundary of the United States to determine how much of it is natural.

Where the boundary is only a straight line, it is marked by a row of posts or stone pillars a few rods apart, and if you were to cross from one country to another you could easily see them.



NORTH AMERICA
Scale of Miles.
0 500 1000
Capitals: ⊙ Other Cities: •
Comparative Area
PENN.
45,215 Square Miles.
100° Longitude West 90° from Greenwich 80°
120°
110°
70°
THE M-N. CO.
ASIA
WRANGEL I.
ARCTIC OCEAN
Bering Str.
Bering Sea
PRIBILOF IS.
Nome
Pt. Barrow
ALASKA
Mt. McKinley
Yukon R.
Mackenzie R.
KLONDIKE
Dawson
Mt. St. Elias
Mt. Logan
KODIAK I.
Sitka
Juneau
Great Bear Lake
Great Slave Lake
ARCTIC ARCHIPELAGO
ARCTIC CIRCLE
BAFFIN LAND
Baffin Bay
Davis Strait
GREENLAND (To Denmark)
ICELAND (To Denmark)
LABRADOR
DOMINION OF CANADA
L. Athabaska
Hudson Bay
James B.
Nelson R.
Lake Winnipeg
Winnipeg
QUEEN CHARLOTTE IS
VANCOUVER I.
Victoria
Vancouver
Columbia R.
Cascade Range
Rocky Mountains
NEWFOUNDLAND
St. Johns
C. Race
Gulf of St. Lawrence
St. Lawrence R.
Quebec
Montreal
Ottawa
Toronto
Halifax
St. John
NOVA SCOTIA
The Great Lakes
Boston
New York
Philadelphia
Baltimore
Washington
Chicago
St. Louis
Missouri R.
Mississippi R.
Ohio R.
Arkansas R.
Red R.
Appalachian Mts.
C. Hatteras
BERMUDA IS. (Br.)
UNITED STATES
C. Mendocino
San Francisco
Great Salt Lake
Sierra Nevada
Coast Range
Colorado R.
Rio Grande
LOWER CALIFORNIA
Gulf of California
Sierra Madre
MEXICO
New Orleans
FLORIDA
PACIFIC OCEAN
ATLANTIC OCEAN
TROPIC OF CANCER
C. San Lucas
C. Sable
Florida Str.
Gulf of Mexico
Havana
CUBA
BAHAMA (Br.) ISLANDS
WEST INDIES
GREATER ANTILLES
HAITI
PORTO RICO (To U.S.)
JAMAICA (Br.)
YUCATAN PENINSULA
Mexico
Vera Cruz
Acapulco
Caribbean Sea
LESSER ANTILLES
CENTRAL AMERICA
Lake Nicaragua
Colon
PANAMA CANAL
ISTHMUS OF PANAMA
PANAMA
Panama
SOUTH AMERICA

FIG. 123.

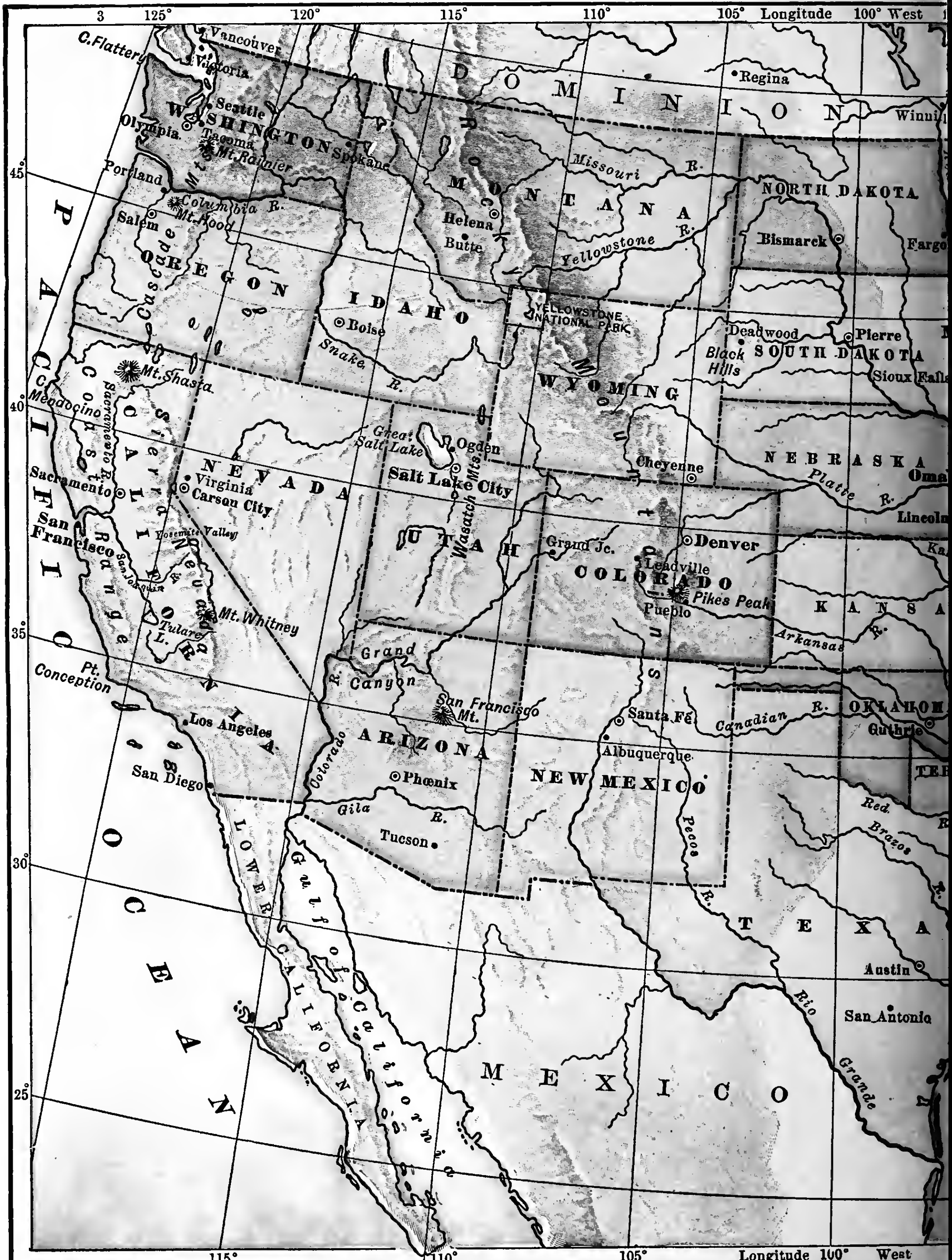
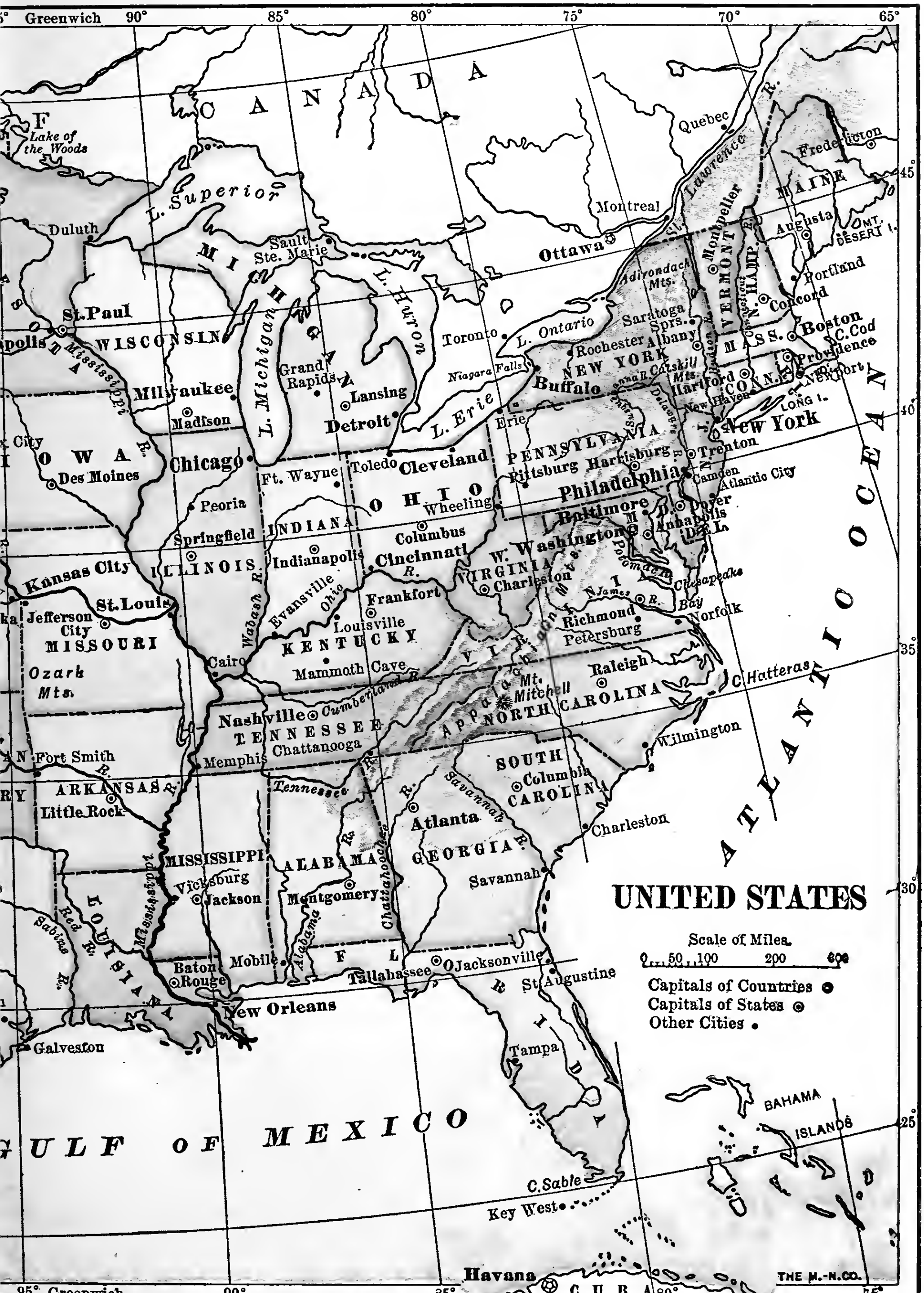

Longitude
West
C. Flattery
Vancouver
Victoria
Seattle
Olympia
Tacoma
WASHINGTON
Mt. Rainier
Spokane
Portland
Columbia R.
Mt. Hood
Salem
OREGON
Cascade
DOMINION
Regina
Winni
Missouri R.
MONTANA
Helena
Butte
Yellowstone R.
NORTH DAKOTA
Bismarck
Fargo
IDAHO
Boise
Snake R.
YELLOWSTONE NATIONAL PARK
WYOMING
Deadwood
Pierre
Black Hills
SOUTH DAKOTA
Sioux Falls
Mt. Shasta
C. Mendocino
Coast
Sacramento R.
Sierra
CALIFORNIA
Great Salt Lake
Ogden
NEVADA
Virginia
Carson City
Salt Lake City
Cheyenne
NEBRASKA
Platte R.
Omaha
Lincoln
Sacramento
San Francisco
Yosemite Valley
San Joaquin
Range
Nevada
Wasatch Mts.
UTAH
Grand Jc.
Denver
Leadville
COLORADO
Pikes Peak
Pueblo
KANSAS
Arkansas R.
Mt. Whitney
Tulare L.
Pt. Conception
Grand Canyon
Colorado R.
San Francisco Mt.
Santa Fé
Canadian R.
OKLAHOMA
Guthrie
Los Angeles
ARIZONA
Albuquerque
NEW MEXICO
San Diego
Phœnix
Gila R.
Tucson
Pecos R.
Red R.
Brazos R.
TEXAS
Austin
San Antonio
Rio Grande
LOWER CALIFORNIA
Gulf of California
MEXICO
PACIFIC OCEAN
125°
120°
115°
110°
105°
100°
45°
40°
35°
30°
25°

FIG.



UNITED STATES
Scale of Miles
0 50 100 200 300
Capitals of Countries
Capitals of States
Other Cities
CANADA
ATLANTIC OCEAN
GULF OF MEXICO
L. Superior
L. Michigan
L. Huron
L. Erie
L. Ontario
Lake of the Woods
Quebec
Montreal
Ottawa
Toronto
Fredericton
MAINE
Augusta
MT. DESERT I.
Portland
N. HAMP.
Concord
VERMONT
Montpelier
MASS.
Boston
C. Cod
Providence
Newport
CONN.
Hartford
New Haven
LONG I.
New York
NEW YORK
Albany
Saratoga Sprs.
Adirondack Mts.
Catskill Mts.
Rochester
Buffalo
Niagara Falls
Erie
PENNSYLVANIA
Harrisburg
Pittsburg
Philadelphia
Trenton
Camden
Atlantic City
Dover
DEL.
Baltimore
Annapolis
Washington
W. VIRGINIA
Charleston
Wheeling
Potomac
Chesapeake Bay
James R.
Richmond
Petersburg
Norfolk
Raleigh
NORTH CAROLINA
C. Hatteras
Wilmington
Mt. Mitchell
SOUTH CAROLINA
Columbia
Charleston
GEORGIA
Atlanta
Savannah
Savannah R.
FLORIDA
Tallahassee
Jacksonville
St. Augustine
Tampa
C. Sable
Key West
Havana
CUBA
BAHAMA ISLANDS
ALABAMA
Montgomery
Mobile
Chattahoochee R.
Alabama R.
Tennessee R.
TENNESSEE
Nashville
Chattanooga
Memphis
Cumberland R.
KENTUCKY
Frankfort
Louisville
Mammoth Cave
OHIO
Columbus
Cincinnati
Cleveland
Toledo
Ohio R.
INDIANA
Indianapolis
Ft. Wayne
Evansville
Wabash R.
ILLINOIS
Springfield
Chicago
Peoria
Cairo
MICHIGAN
Lansing
Detroit
Grand Rapids
Sault Ste. Marie
WISCONSIN
Madison
Milwaukee
St. Paul
Duluth
IOWA
Des Moines
MISSOURI
Jefferson City
St. Louis
Kansas City
Ozark Mts.
ARKANSAS
Little Rock
Fort Smith
MISSISSIPPI
Jackson
Vicksburg
Mississippi R.
LOUISIANA
Baton Rouge
New Orleans
Red R.
Sabine R.
Galveston
Appalachian Mts.
Greenwich
95° Greenwich
90°
85°
80°
75°
70°
65°
45°
40°
35°
30°
25°
THE M.-N. CO.

VIII. THE UNITED STATES

Map Questions. — (1) What waters border the United States? (2) What countries? (3) What is the greatest distance across the United States, east and west? (Notice the scale of miles on the map.) North and south? (4) Where are the main divides? (5) Do you see any part that has very few streams? What does that suggest to you? (6) Find New York, Philadelphia, Boston, Baltimore, Washington, Chicago, New Orleans, St. Louis, Denver, and San Francisco, and tell where each is.

When our war for independence began there were thirteen large groups of settlements, each of which was absolutely independent of the others, called *colonies*, which at the close of the war became known as *states*. Our flag still has its thirteen red and white stripes to remind us of them.

There were at first only thirteen stars in the blue field of the flag; but one has been added for each new state until now there are many more. Count the stars on a flag to see how many states there are.

For a long time after the war for independence, the interior and western parts of what is now the United States formed an unknown wilderness belonging to other nations, and inhabited chiefly by Indians. The United States has obtained part of this land by war, and part of it by purchase, so that the country is now several times as large as it was at first. Many large states have been added; but there are still some parts, called *territories*, which have not yet been made into states.

In order that they may be more easily studied, the states are usually divided into groups. Let us take first the northeastern group called the *New England States;* and afterwards, others.

IX. NEW ENGLAND

MAP QUESTIONS. — (1) Name the six states included in New England. (2) Which is largest? (3) Which smallest? (4) Which has no seacoast? (5) What mountains are found in these states? What rivers? (6) Remembering what was said on pages 66 and 90, where would you expect to find the largest cities? (7) What is the capital of each state? (8) Point to Cambridge in Massachusetts, where Longfellow lived. (9) To Boston. Walk toward Boston. (10) In what direction would one sail from there to reach England? (See Fig. 120.)

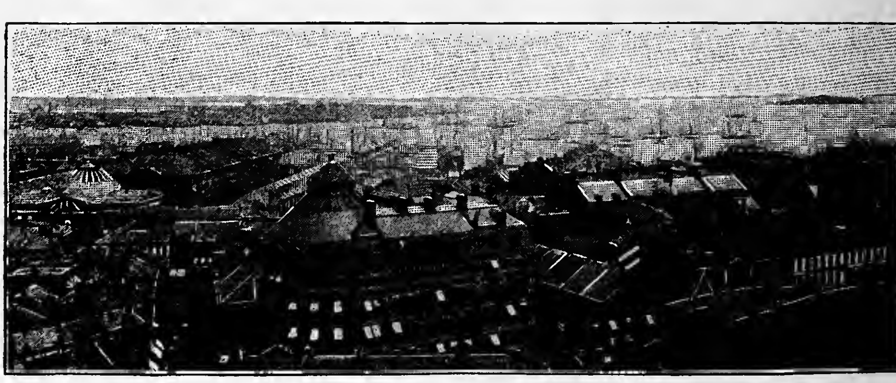


FIG. 126.
A view of Boston, the largest city in New England, showing its harbor and some of the ships in it.

Names. -- The settlers who came to this part of North America called it New England. Several names on the map also commence with *New*, as New Hampshire and New Haven. Find others. What reason can you give for their using that word so often?

Seaports. — If you examine the map you will notice that the coast is very irregular, with many small bays, promon-

NEW ENGLAND STATES
Scale of Miles.
0 10 20 30 40 50 100
Capitals
Other Cities
74°
72° Longitude
West 70° from
Greenwich 68°
47°
45°
43°
41°
QUEBEC
NEW BRUNSWICK
MAINE
NEW HAMPSHIRE
VERMONT
NEW YORK
MASSACHUSETTS
CONNECTICUT
RHODE ISLAND
ATLANTIC
OCEAN
Quebec
St. Lawrence
Lake St. Peter
Montreal
Chaudiere R.
St. John
Houlton
Mt. Katahdin
Moosehead Lake
Schoodic Lake
St. Croix R.
Calais
Eastport
Bangor
Penobscot
Kennebec R.
Androscoggin R.
Augusta
Bar Harbor
MT. DESERT I.
Rockland
Lewiston
Auburn
Bath
Portland
Biddeford
Mt. Washington
White Mts.
St. Albans
Burlington
Montpelier
Lake Champlain
Richelieu R.
Green Mts.
Rutland
L. George
Connecticut R.
Rochester
Dover
Concord
Portsmouth
Manchester
Merrimac R.
Keene
Brattleboro
Troy
Albany
Nashua
Lawrence
Lowell
Salem
C. Ann
Gloucester
Cambridge
Lynn
Massachusetts Bay
Boston
Holyoke
Worcester
Springfield
C. Cod
Cape Cod Bay
Plymouth
Pawtucket
Providence
Fall River
Hartford
Waterbury
New Haven
Bridgeport
New Bedford
Newport
NANTUCKET I.
MARTHAS VINEYARD I.
BLOCK I.
Montauk Pt.
Long Island Sound
LONG ISLAND
Hudson R.
New York
New York Bay
THE M-N. CO.

FIG. 125.

tories, and fine harbors. Draw the coast-line, showing some of these.

The excellent harbors have determined the places where great cities should grow up. The largest of all is BOSTON, and two others are PORTLAND and PROVIDENCE. Point them out. What direction is each from the others, and in what state is each?

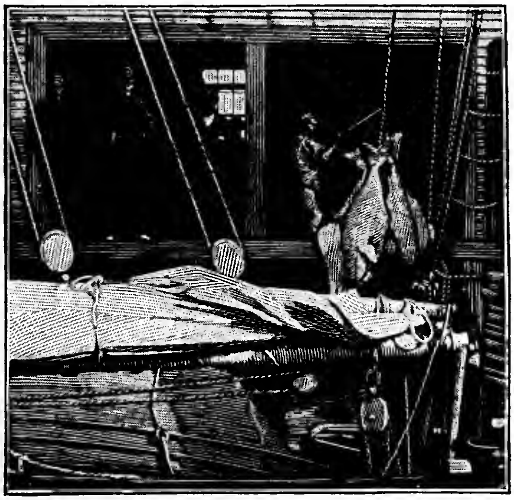


FIG. 127.

Fishermen hoisting halibut from a fishing vessel at Gloucester. Notice that these fish are as large as a man.

Fishing. — Some of the towns are located on the coast because the men who live in them are fishermen, and must have their homes near the water. In the early days, cod, mackerel, and halibut were easily caught near the shore; but now it is often necessary to sail far from land, the men being gone perhaps for weeks before filling their vessels (Fig. 67, p. 73) with fish.

PORTLAND, BOSTON, and GLOUCESTER[1] are important fish markets, the latter being the largest fishing port in the country. Fish is sent from there to all parts of the United States, and even to foreign countries.

Farming. — A fine harbor by itself cannot make a great city. As you remember (p. 59), this is important simply because it renders the loading and unloading of vessels both easy and safe. But unless there were many people supplying and needing materials, there would be little need of using these harbors.

[1] Whenever cities, rivers, etc., are mentioned in the text, the pupils should be required to locate them on the map, giving state and position.

Let us see, then, if there are many people living farther inland and what they do.

One might expect that there would be much farming here; but there are so many hills and mountains, and the soil is often so thin and stony, that the farms are usually small, supplying only vegetables, milk, butter, and other products to be used in the cities near by. Some of them, far from the cities, have been abandoned because the land is so hilly and the soil so poor.

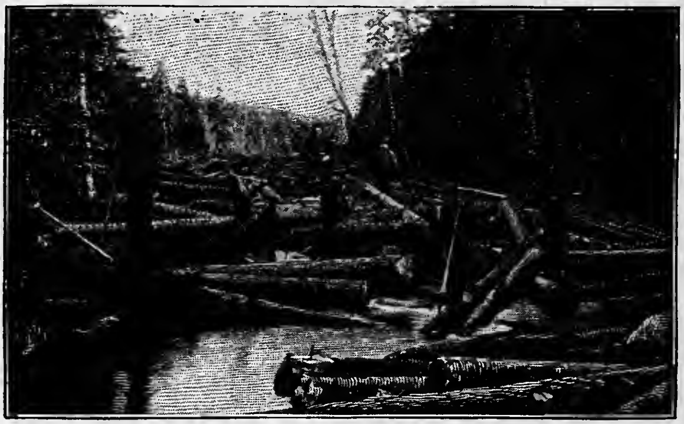


FIG. 128.

Lumbermen engaged in floating logs down-stream from the forest.

Quarrying. — But while the rocky hills and mountains hinder farming, they often furnish excellent *granite*, which is used for buildings and street pavements. White *marble*, used in monuments, is also found among the mountains near RUTLAND, Vermont; and *slate*, for roofs of houses, and for writing slates, is obtained both in Vermont and Maine.

Lumbering. — Since many of the hills and mountains are still covered with forests, much lumber is obtained from them, especially from the mountainous part of northern Maine. As you can see from the map (Fig. 125),

there are very few towns in this section, most of the country being wooded.

During spring freshets, when the winter snows are melting, the logs are floated down-stream, often to a place where ocean steamers can reach them. Here they are sawed into lumber and loaded upon vessels to be carried in all directions. BANGOR, on the Penobscot River, has become a large city, chiefly because of its lumber industry. Other towns on the Kennebec and the Androscoggin rivers have grown in the same way.

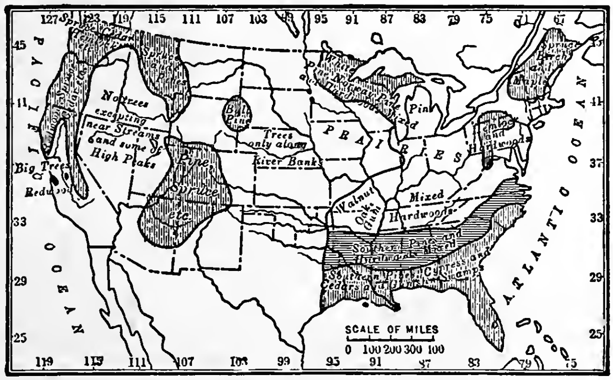


FIG. 129.

Map showing the regions from which considerable timber is now being obtained.

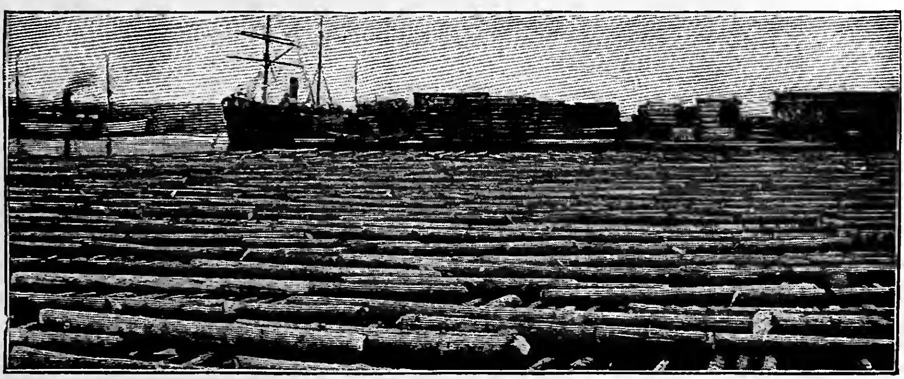


FIG 130

Lumber ships loading boards from the great piles that can be seen on the wharf. Here are also many logs ready to go to the saw-mill to be made into boards.

Manufacturing. — But we have not yet come to the most important occupation of the New England people. The short rivers, having their sources in the uplands, flow with swift course to the sea, and are often interrupted by rapids and falls. In one way this is a disadvantage, because vessels cannot go far up-stream ; but in another way it is a great advantage. Can you see how?

On page 50 you learned that streams with swift currents and waterfalls furnish the best water-power. Where such power is abundant, wheels can be turned and great factories be run. This makes it clear why the chief in-

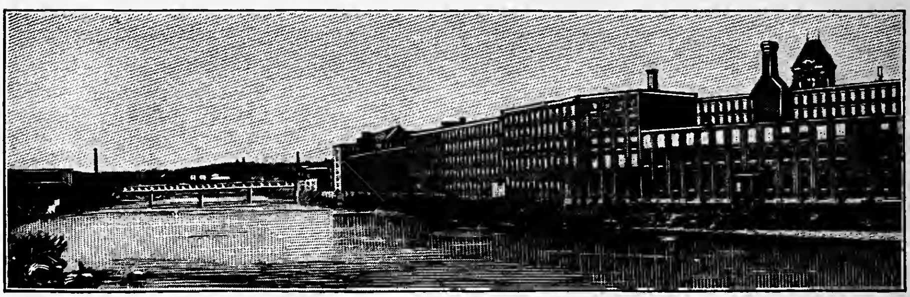


Fig. 131.
Great cotton-mills on the Merrimac River at Manchester, New Hampshire.

dustry of New England is manufacturing. In fact, the New England states are among the most important manufacturing states in the Union.

The principal rivers that furnish water-power are the Merrimac, Connecticut, and the three in Maine already mentioned (p. 145). Find each of these, and trace its course from source to mouth. Make a drawing to represent each one, and locate upon it some of the large cities.

There is so much manufacturing in New England, by the use of water-power and steam, that shiploads of cotton

are sent there to be made into cloth at such cities as MANCHESTER (Fig. 131), LOWELL, NEW BEDFORD, and FALL RIVER. Great quantities of wool are brought to be made into woollen goods at LAWRENCE and PROVIDENCE, which also manufacture cotton goods ; and thousands of hides of cattle and other animals to be made into boots, shoes, gloves, and leather of all kinds at LYNN and other cities. Iron and other metals are also brought to be made into knives, needles, watches, firearms, machines, and hundreds of other articles at WORCESTER, BRIDGEPORT, SPRINGFIELD, NEW HAVEN, and HARTFORD. In Boston itself there is also a vast amount of manufacturing of different kinds.

Find each of these cities; tell in what state it is and upon what river, if the name is given on the map. All of the other cities marked on the map are also engaged in some kind of manufacturing. Perhaps the shoes or some of the clothing that you wear were made in one of these places.

Commerce. — Some of the manufactured articles are shipped to all parts of the United States, and even to other countries. It is to a considerable extent this immense amount of manufacturing that furnishes employment to the people along the coast, and has caused the large cities to grow about the best harbors.

Not only do the persons living in the interior produce great quantities of goods to be shipped away, but they require others to be shipped in. Much of their food and also the cotton, wool, and hides must be brought to them. The amount of shipping is therefore very great, and this is one of the chief reasons why BOSTON, PORTLAND, and PROVIDENCE have become large cities. To the first two goods are sent by rail from the far West to be shipped abroad.

Review Questions. — (1) Why is it an advantage to New England that its coast is so irregular? (2) Mention some of the larger seaports. (3) Name the principal fishing port in the country. (4) Tell what you can about the farming. (5) What kinds of stone are found, and for what are they used? Where are they found? (6) Describe the lumbering. Which state produces the most lumber? (7) Explain how the lumber trade has determined the location of Bangor. On what river is it situated? (8) Why cannot vessels go far up the New England rivers? (9) How are the rivers useful for manufacturing? Name several that furnish water-power. (10) What goods are manufactured there? In what cities? (11) What articles must be shipped to this section? Why? (12) Tell how such commerce affects the size of the coast cities.

Suggestions. — (1) What stories of New England do you know? (2) Read about the Puritans. (3) Go into a fish store to see a codfish, mackerel, halibut, etc. (4) Examine some granite so that you will know it the next time you see it. (5) Find a monument made of white marble. (6) Find a house whose roof is covered with slate. (7) Start a collection for the school by bringing specimens of useful stones. (8) Try to find out more about lumbering in Maine. Hunt for pictures illustrating this work. (9) Start a school collection of pictures from magazines, etc. (10) How many articles can you mention that are made of wood? (11) Get some friend to take you through some kind of a factory, and tell the class what you saw. (12) Draw a sketch-map of New England, locating the rivers, capital cities, and principal towns.

For References, see page 259.

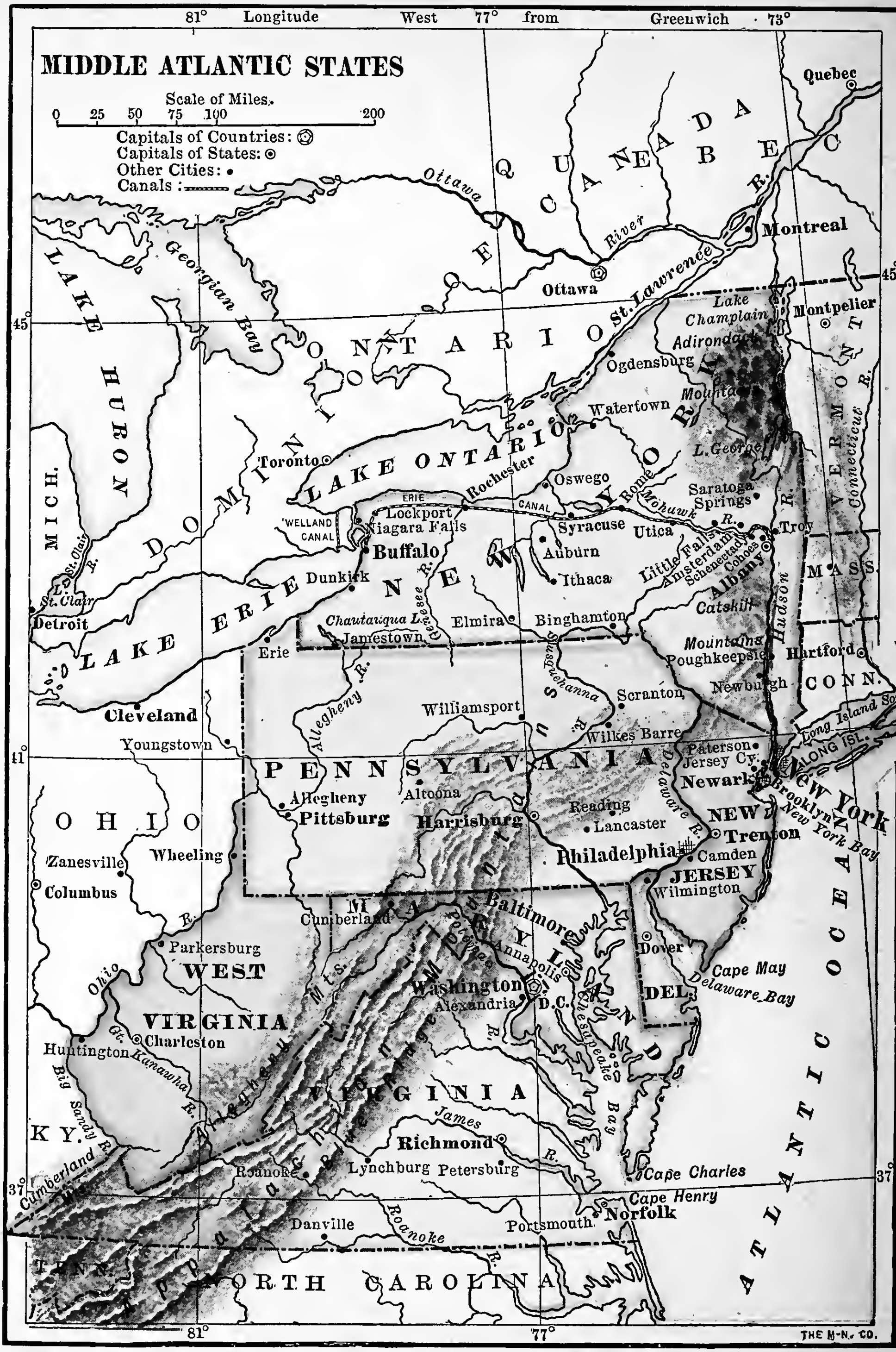

MIDDLE ATLANTIC STATES
Scale of Miles.
0 25 50 75 100 200
Capitals of Countries:
Capitals of States:
Other Cities:
Canals:
81° Longitude West 77° from Greenwich 73°
45°
41°
37°
DOMINION OF CANADA
QUEBEC
ONTARIO
Quebec
Montreal
Ottawa
Toronto
Ottawa River
St. Lawrence R.
Georgian Bay
LAKE HURON
LAKE ONTARIO
LAKE ERIE
MICH.
L. St. Clair
St. Clair R.
Detroit
Cleveland
Youngstown
OHIO
Zanesville
Columbus
Ohio R.
NEW YORK
Lake Champlain
Adirondack Mountains
L. George
Ogdensburg
Watertown
Oswego
Rochester
Rome
Mohawk R.
Saratoga Springs
Lockport
ERIE CANAL
WELLAND CANAL
Niagara Falls
Buffalo
Dunkirk
Syracuse
Utica
Troy
Auburn
Ithaca
Little Falls
Amsterdam
Schenectady
Cohoes
Albany
Catskill Mountains
Chautauqua L.
Jamestown
Genesee R.
Elmira
Binghamton
Poughkeepsie
Newburgh
Hudson R.
Long Island Sound
LONG ISL.
New York
Brooklyn
New York Bay
VERMONT
Montpelier
Connecticut R.
MASS.
CONN.
Hartford
PENNSYLVANIA
Erie
Allegheny R.
Williamsport
Susquehanna R.
Scranton
Wilkes Barre
Allegheny
Pittsburg
Altoona
Harrisburg
Reading
Lancaster
Philadelphia
Delaware R.
NEW JERSEY
Paterson
Jersey Cy.
Newark
Trenton
Camden
Wilmington
Cape May
Delaware Bay
DEL.
Dover
MARYLAND
Cumberland
Baltimore
Annapolis
Potomac R.
Washington
D.C.
Alexandria
Chesapeake Bay
WEST VIRGINIA
Wheeling
Parkersburg
Charleston
Gt. Kanawha R.
Huntington
Big Sandy R.
KY.
Cumberland Mts.
Allegheny Mts.
Blue Ridge
Appalachian
VIRGINIA
James R.
Richmond
Lynchburg
Petersburg
Roanoke
Roanoke R.
Danville
Portsmouth
Norfolk
Cape Henry
Cape Charles
ATLANTIC OCEAN
TENN.
NORTH CAROLINA
THE M-N. CO.

FIG. 132.

X. MIDDLE ATLANTIC STATES

Map Questions. — (1) Which of the Middle Atlantic states border on the Atlantic Ocean? (2) Which does not? (3) Which is smallest? (4) How does Pennsylvania compare in size with New England? (You will find the scale on each map.) (5) Name the chief rivers and tell where they are. (6) Which state extends farthest east? Which farthest west? (7) What natural boundaries do you find between them? (What are the names of the mountain ranges? (9) Which state has no mountains?

The Coast-line. — Observe that, as in New England, the coast-line of the Middle Atlantic states is very irregular. At three places the sinking of the land has caused the ocean water to reach far into the land, forming Chesapeake, Delaware, and New York bays. Find each; also draw the coast-line to show these bays.

The Seaports. — The largest cities in New England were found along the coast on bays similar to these, though smaller. The same is true here. New York, on the last-named bay, is the largest city in the United States and next to the largest in the world. Southwest of it is Philadelphia on the Delaware, just as far up the river as large ocean vessels can go. Farther south, near the head of Chesapeake Bay, is a third great city, named Baltimore, in the state of Maryland.

Reasons for the Great Size of New York City

Cities near by. — Near New York harbor we find not only New York, but Jersey City, Newark, and Brooklyn,

which has lately become a part of GREATER NEW YORK. Other cities like PATERSON are not far away. That is, not only one, but several great cities have grown up here very near together. Let us see why more people should have crowded together here than in any other part of the New World.

One reason is that from New York harbor, where hundreds of vessels may anchor at one time, goods can be shipped over the Atlantic Ocean to various parts of the world.

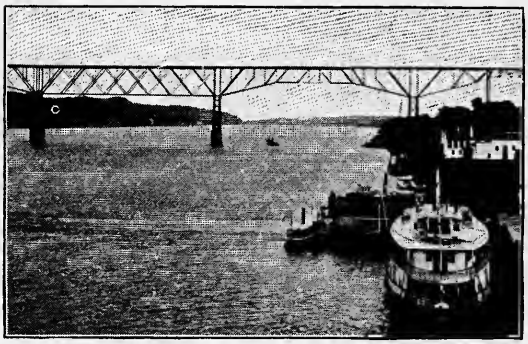


FIG. 133.
The broad Hudson River at Poughkeepsie, where a railway bridge crosses it.

Water-route to the Interior. — A second reason is that goods may also be shipped westward by water. Looking at the map, you see that New York Bay is at the mouth of the Hudson River. The sinking of the land has caused the ocean water to enter this river, and thereby to make it so broad and deep that large vessels can ascend it as far as ALBANY.

A few miles from Albany the Mohawk River enters the Hudson from the west, having its source far over toward SYRACUSE.

Long ago people saw that if they could construct a water-way from the Hudson River to BUFFALO, they could go by water all the way from New York to Buffalo; and then, since the Great Lakes are connected with one another, they could go all the way to the western end of Lake Superior. Use the scale of the map (Fig. 124)

to find how many miles that is. Through what lakes would the route lead?

The scheme was finally carried out by building the *Erie Canal* from BUFFALO, on Lake Erie, to the Mohawk Valley, then down that valley to ALBANY. (See map, Fig. 132.)

As the Western country became settled, more and more goods were shipped to and from New York. When railways began to be built many of them also led there. In this way New York has become a great city, and the chief shipping-point for a large part of the United States. Let us see what some of the goods are that are sent to New York.

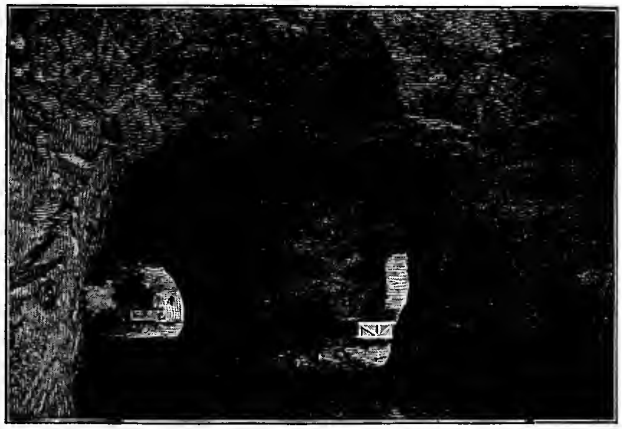


FIG. 134.

In a salt mine, a thousand feet beneath the surface, in central New York. The walls and sides of these tunnels are glistening white salt.

Lumbering. — On the map (Fig. 132) you will find the Adirondack Mountains north of the Mohawk, and the Catskill Mountains south of it. Among these there are still forests, as in Maine, so that lumbering is an important industry there.

Farming. — These mountains do not cover all of the state; most of it is more level, and has a rich soil upon it. Farming is therefore much more important than in New England. Besides butter and cheese, considerable hay and grain are produced, and an abundance of fruit, such as apples, pears, peaches, plums, and grapes.

Salt. — An extensive bed of salt is found deep down in the earth, in the central part of the state. Salt is taken from it in many places, and it was the important salt industry that determined the location, and much of the early growth, of SYRACUSE.

Manufacturing. — Again, in this state, as in New England there are many streams with waterfalls. Manufacturing has therefore become extensive.

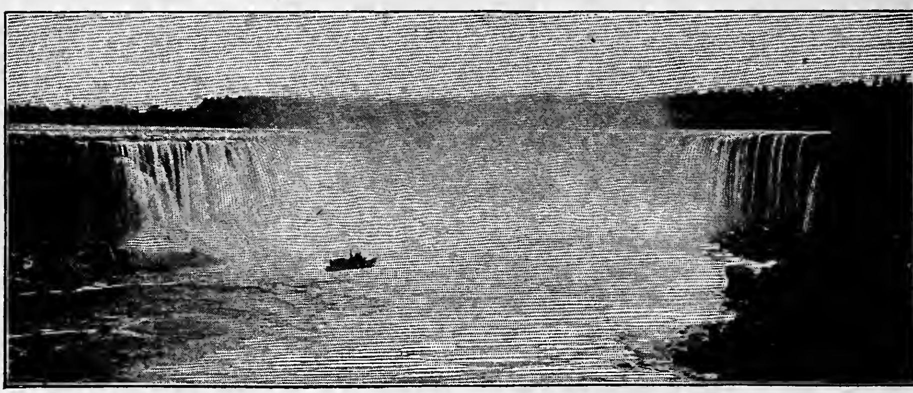


FIG. 135.

Niagara Falls, the greatest cataract in the world (160 feet high).

In ROCHESTER, at the falls of the Genesee River (Fig. 75, p. 85), are many flour mills. The cities on the Mohawk are also engaged in manufacturing. What are their names? In BUFFALO, the second city in size in New York State, much use is made of power from the Niagara Falls, twenty miles away. TROY, near ALBANY, makes shirts, collars, and cuffs. These cities, as you see, are situated along the water-route already mentioned. Why? What others do you find along this route?

In NEW YORK CITY itself there is a vast amount of manufacturing, steam being used for power. In fact, in many places, even where there is water-power, factories now often use steam; but when the manufacturing began, people could not use steam because they did not know how, and the first manufacturing towns were built where there was water-power.

Commerce. — So much manufacturing, together with the farming and other industries of the state, helps to explain the great amount of commerce. People are continually sending goods to New York and receiving others in exchange. It should be remembered, too, that cities hundreds of miles farther west, in the neighborhood of the Great Lakes, are connected with New York by water and rail, and are engaged in trade with it.

From this it is plain why the largest city in America is situated where it is, and why other cities have grown up about New York harbor.

Reasons why Philadelphia has become a Great City

Cities near by. — PHILADELPHIA, like New York, has other important cities near by. Directly across the Delaware is CAMDEN in New Jersey; and to the northeast, also in New Jersey, is TRENTON, where a clay is found that is made into dishes and earthenware. To the southwest is WILMINGTON in Delaware, where many ships and railway cars are built.

Farming. — The soil and climate in this neighborhood are well adapted to growing such fruits as peaches, pears, apples, grapes, and berries. On this account there are many factories for canning fruit in some of these cities.

To the northwest of Philadelphia are the Appalachian Mountains. Note the direction in which they extend across the state. The valleys among the mountains, and the plateaus and lowlands east and west of them, are fertile enough for good farming, especially wheat raising, sheep raising, and dairying; but lumbering is still carried on among the mountains.

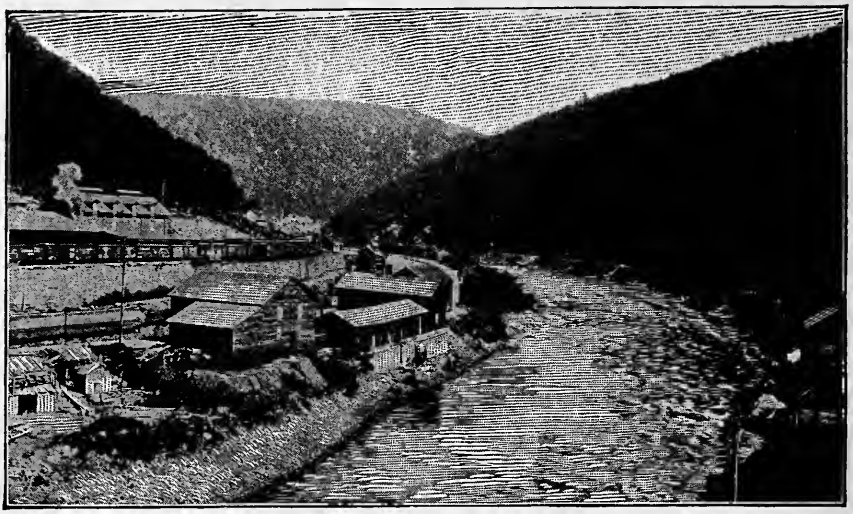


FIG. 136.
The forest-covered slopes of the Appalachian Mountains in Pennsylvania, at Mauch Chunk.

Iron. — Several substances found beneath the soil in Pennsylvania are its most important products.

In the first place, a great amount of iron ore is found there. When dug out of the ground this often resembles reddish earth, and it never looks exactly like iron; but by melting the ore, iron is obtained from it, and is then shipped to many places to be made into stoves, engines, guns, ships, knives, and a thousand other things. PITTSBURG and ALLEGHENY are noted for such manufacturing; also READING and HARRISBURG, the capital, as well as Philadelphia and its neighboring cities. See how long a list you can make of articles made of iron and steel.

Coal. — It requires an immense amount of fuel to produce the heat necessary to obtain iron from the ore and to make it into the many articles mentioned. Fortunately great quantities of coal are also found in this state, soft

FIG. 137.

In a Pennsylvania coal mine, where the walls are black instead of white as in the salt mine (Fig. 134).

coal being mined in the western part near PITTSBURG and ALLEGHENY, and hard or *anthracite* coal in the eastern part near SCRANTON and WILKES BARRE.

Much coal is needed for stoves and furnaces in houses, and also for producing steam for factories. There is, therefore, a great demand for it, and every year it is shipped by thousands of car-loads to New York, Philadelphia, and elsewhere, often to be loaded upon ships to be sent to Boston and many other cities.

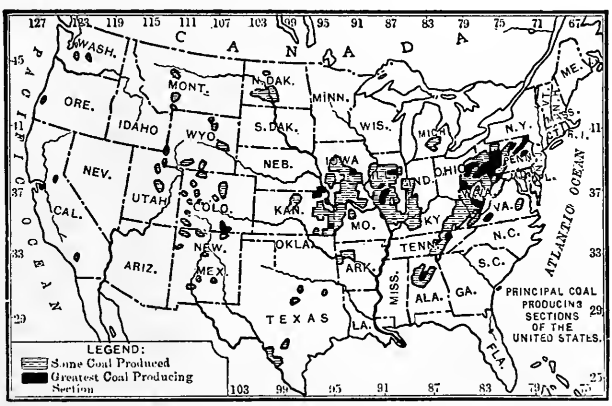


FIG. 138.

Oil and Gas. — Gas, much like that used in lighting

houses, and *petroleum*, the oil from which kerosene is made, are also found beneath the soil in the western part of Pennsylvania and New York. There is so much gas in some places that it is burned as a fuel in manufacturing glass and other articles, as at Pittsburg and elsewhere.

Commerce. — The products of Pennsylvania, New Jersey, and Delaware, principally fruit, grain, lumber, iron, coal, gas, and oil, together with the manufacture of iron goods, have helped to make Philadelphia a great city. As in the case of New York, many of these substances are sent to Philadelphia to be manufactured; and, like New York, Philadelphia is one of the great manufacturing cities of the country. Many other materials are sent there to be shipped away by water; and many ship-loads of goods, for people living in other cities farther west, are unloaded at Philadelphia.

Other Cities

Baltimore. — Baltimore has grown in much the same way. Its harbor is excellent, and both coal and iron can easily reach it from Pennsylvania. Like Philadelphia, Boston, and New York, it has an important commerce and much manufacturing.

Oysters abound in the shallow waters of Chesapeake Bay, and are shipped from Norfolk, Annapolis, and Baltimore.

Washington. — Another large city in this section is Washington, on the Potomac River in the District of Columbia. Although large vessels are able to reach it, it owes its importance not to commerce, but to the fact that it is the *National Capital*, where there are many great government buildings (Fig. 85, p. 99), and thousands of men and women employed in the service of the government. Can you describe some of the work which they are required to do?

Virginia and West Virginia. — RICHMOND, on the James River, is the capital and most important city of Virginia, the state in which Washington and Jefferson lived. The western part of the state is mountainous, as is the eastern part of West Virginia, the mountains furnishing lumber and iron. Also in West Virginia, as in Pennsylvania, there is a great amount of coal, oil, and gas. This leads to extensive manufacturing, especially at WHEELING, on the Ohio River.

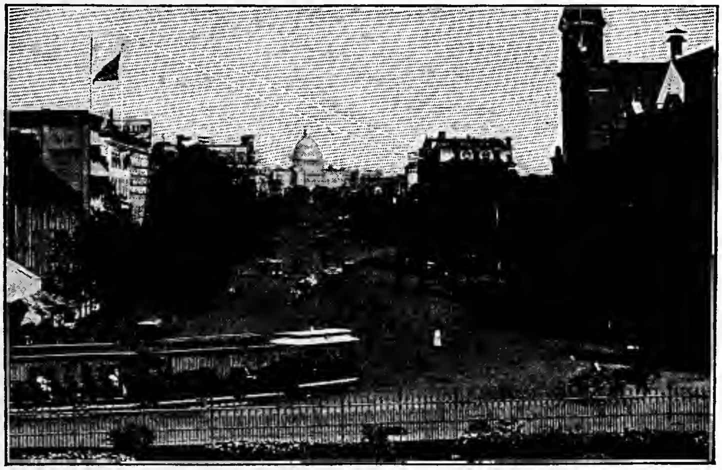


FIG. 139.

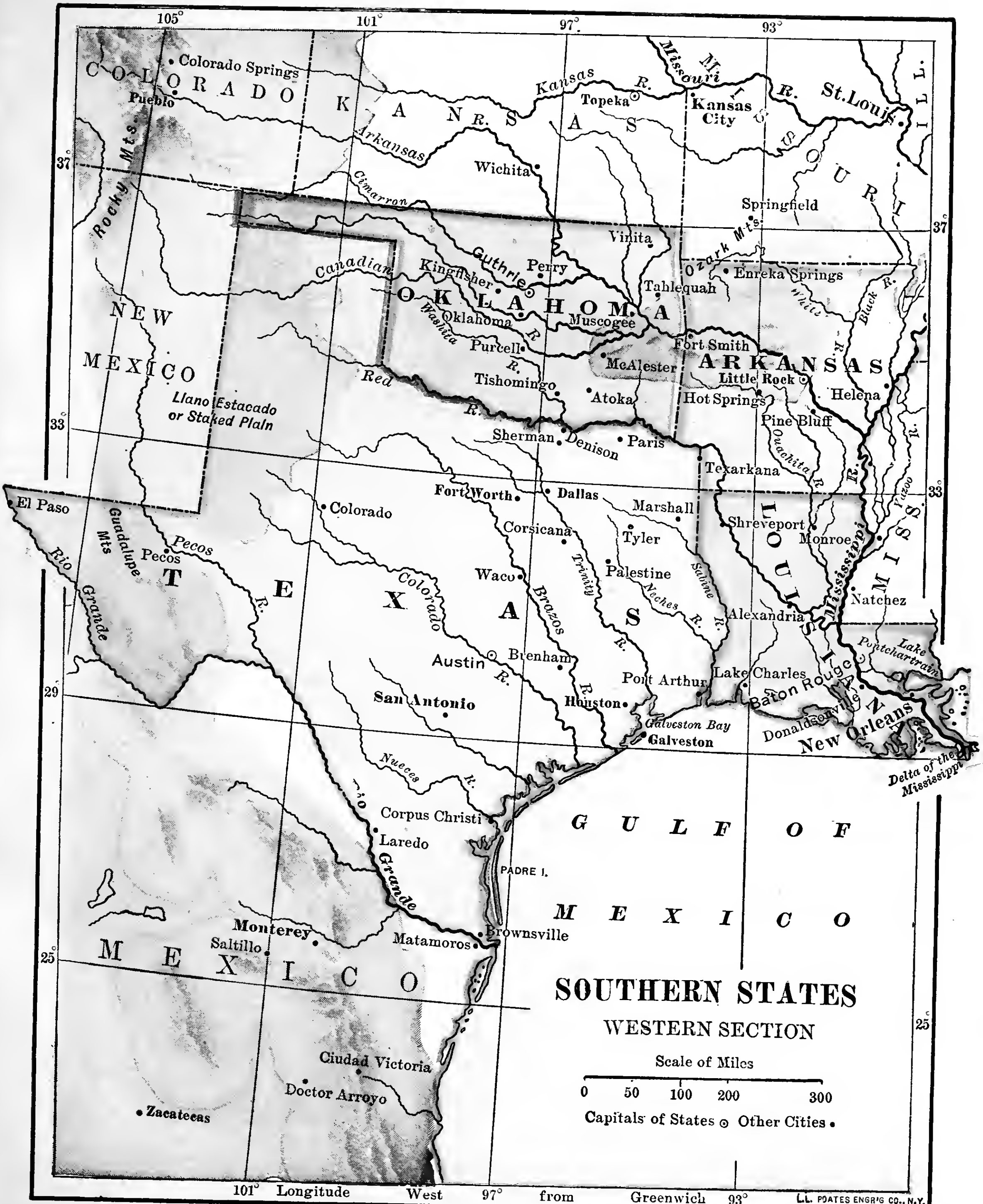
A picture of Pennsylvania Avenue in Washington, with the National Capitol building standing at the farther end.

Farming is the chief work in Virginia. The climate is so mild that tobacco can be raised much more profitably than in the states farther north. The tobacco plant, which white men found the Indians smoking, has a large leaf that is picked and dried, and then made into cigars and other forms in which tobacco is used. Factories are needed for such work, and they represent one of the main industries of RICHMOND, which is a great tobacco market, as Gloucester is a great fish market.

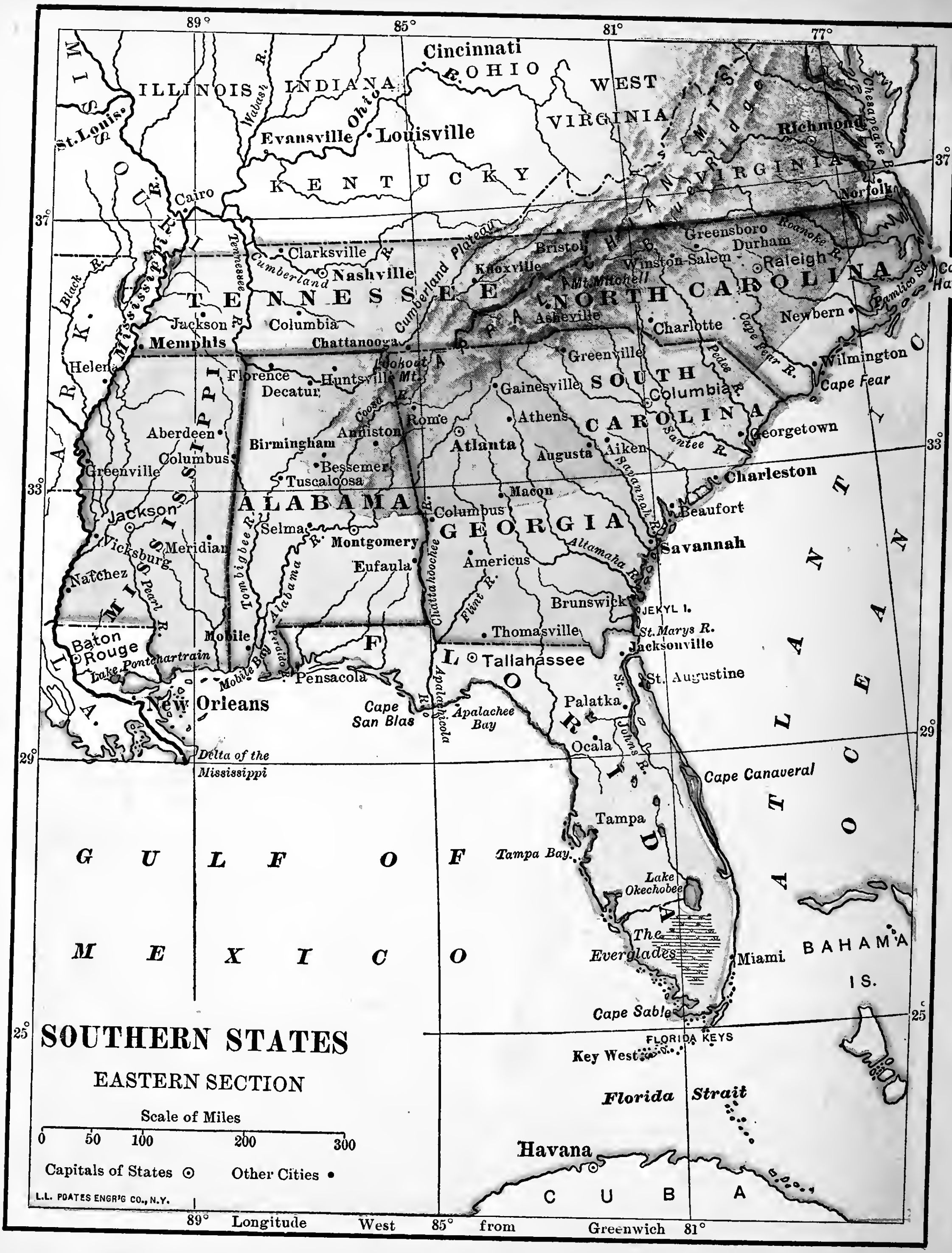
Review Questions. — (1) Name the chief seaports. **Walk toward** each as you name it. (2) What reasons can you give for the great size of New York City? (3) Make a drawing of the Hudson and Mohawk rivers. (4) What cities do you find on the Erie Canal? (5) What can you say about the farming in New York State? (6) Where is the salt found? (7) What about manufacturing in New York? (8) What are the chief farm products near Philadelphia and Wilmington? (9) Why is iron manufacture so important in Pennsylvania? (10) Tell why Philadelphia has become a great city. (11) Where are Pittsburg, Allegheny, Scranton, and Wilkes Barre? (12) For what is Baltimore noted? (13) Washington? (14) For what industry is Richmond noted? (15) Where are Richmond and Wheeling? (16) In which state is each of the cities mentioned?

Suggestions. — (1) Make a list of all the cities named. (2) Are any of them not situated either upon the seashore, on rivers, or lakes? (3) Which is farther north, Buffalo or Boston? (See Fig. 124, opposite p. 141.) (4) Find what some of the chief difficulties are in building canals. (5) Examine some iron ore and add it to the school collection. (6) Visit a factory where iron goods are manufactured. (7) Why does Buffalo promise to be a growing city? (8) Why have Pittsburg and Allegheny a good location? (9) Give two reasons why Wilmington is a good place for shipbuilding. (10) Collect some pieces of anthracite or hard, and bituminous or soft, coal, and compare them. (11) Read the story of Rip Van Winkle. The mountains described are the Catskills. (12) Draw an outline map of these states and include the capitals. (13) Draw each of the states from memory. (14) Find out some facts about Washington, — its buildings, the people who live there, and what they do. (15) On the map (Fig. 124, opposite p. 141) the word Delaware is not spelled out because there is not room, but Del. is put in its place. All the states have abbreviations like this, which we use in writing letters. Find out the abbreviation for each state in this group and in New England. Also for the other states as you study about them.

For References, see page 259.



SOUTHERN STATES
WESTERN SECTION
Scale of Miles
0 50 100 200 300
Capitals of States ⊙ Other Cities •
COLORADO
KANSAS
MISSOURI
ILL.
OKLAHOMA
ARKANSAS
NEW MEXICO
TEXAS
LOUISIANA
MISS.
MEXICO
GULF OF MEXICO
Colorado Springs
Pueblo
Rocky Mts.
Topeka
Kansas City
St. Louis
Wichita
Springfield
Vinita
Eureka Springs
Ozark Mts.
Perry
Guthrie
Kingfisher
Tahlequah
Oklahoma
Muscogee
Purcell
Fort Smith
McAlester
Little Rock
Helena
Tishomingo
Atoka
Hot Springs
Pine Bluff
Sherman
Denison
Paris
Texarkana
Fort Worth
Dallas
Marshall
Shreveport
Monroe
Colorado
Corsicana
Tyler
Palestine
Waco
Natchez
Alexandria
Austin
Brenham
Port Arthur
Lake Charles
Baton Rouge
Houston
Galveston Bay
Galveston
Donaldsonville
New Orleans
Lake Pontchartrain
Delta of the Mississippi
San Antonio
Corpus Christi
Laredo
PADRE I.
Brownsville
Matamoros
Monterey
Saltillo
Ciudad Victoria
Doctor Arroyo
Zacatecas
El Paso
Pecos
Guadalupe Mts
Llano Estacado or Staked Plain
Kansas R.
Missouri R.
Arkansas R.
Cimarron
Canadian R.
Washita R.
Red R.
White R.
Black R.
Ouachita R.
Mississippi R.
Yazoo
Pecos R.
Rio Grande
Colorado R.
Brazos R.
Trinity R.
Neches R.
Sabine R.
Nueces R.
105°
101°
97°
93°
37°
33°
29°
25°
101° Longitude West 97° from Greenwich 93°
L.L. POATES ENGR'G CO., N.Y.


SOUTHERN STATES
EASTERN SECTION
Scale of Miles
0 50 100 200 300
Capitals of States
Other Cities
L.L. POATES ENGR'G CO., N.Y.
89° Longitude West 85° from Greenwich 81°
Cincinnati
OHIO
ILLINOIS
INDIANA
WEST VIRGINIA
VIRGINIA
KENTUCKY
TENNESSEE
NORTH CAROLINA
SOUTH CAROLINA
GEORGIA
ALABAMA
MISSISSIPPI
FLORIDA
ARK.
LA.
MISSOURI
St. Louis
Evansville
Louisville
Cairo
Richmond
Norfolk
Greensboro
Durham
Raleigh
Winston-Salem
Bristol
Knoxville
Mt. Mitchell
Asheville
Charlotte
Newbern
Wilmington
Cape Fear
Cape Hatteras
Pamlico Sd.
Clarksville
Nashville
Jackson
Columbia
Chattanooga
Memphis
Helena
Florence
Decatur
Huntsville
Lookout Mt.
Rome
Gainesville
Greenville
Columbia
Georgetown
Athens
Atlanta
Augusta
Aiken
Charleston
Beaufort
Savannah
Macon
Columbus
Americus
Brunswick
JEKYL I.
Thomasville
St. Marys R.
Jacksonville
St. Augustine
Tallahassee
Palatka
Ocala
Aberdeen
Columbus
Greenville
Birmingham
Anniston
Bessemer
Tuscaloosa
Selma
Montgomery
Eufaula
Jackson
Vicksburg
Meridian
Natchez
Mobile
Baton Rouge
Lake Pontchartrain
Mobile Bay
Pensacola
New Orleans
Delta of the Mississippi
Cape San Blas
Apalachee Bay
Cape Canaveral
Tampa
Tampa Bay
Lake Okechobee
The Everglades
Miami
Cape Sable
FLORIDA KEYS
Key West
Florida Strait
BAHAMA IS.
Havana
CUBA
GULF OF MEXICO
ATLANTIC OCEAN
Cumberland Plateau
Blue Ridge
Roanoke R.
Cape Fear R.
Pedee R.
Santee R.
Savannah R.
Altamaha R.
Chattahoochee R.
Flint R.
Apalachicola R.
St. Johns R.
Coosa R.
Alabama R.
Tombigbee R.
Tennessee R.
Cumberland R.
Ohio R.
Wabash R.
Mississippi R.
Black R.
Pearl R.
Chesapeake B.
37°
33°
29°
25°
89°
85°
81°
77°

XI. SOUTHERN STATES

Map Questions. — (1) Where are the mountains in this group of states? (2) Where are the plains? (See map, Fig. 140.) (3) Notice the direction in which the land slopes. (4) Name the gulf on the south side. (5) How is Texas separated from Mexico? (6) What large peninsula do you find on this map? (7) Which is the largest state? (8) How does it seem to compare with South Carolina in size? With Pennsylvania? (9) About how many miles is it by sea from New Orleans to Boston? (See map, Fig. 124, opposite p. 141.) (10) Notice how near these states are to the Tropic of Cancer. (See map, Fig. 123, opposite p. 140.) What does that tell you about their climate?

Relief. — The Appalachian Mountains extend into Alabama, passing across several of the Southern states. Name them. There are also some low mountains in western Arkansas and Missouri, and a portion of the Rocky Mountains in western Texas.

But this part of the country is mainly a great region of plains. Near the mountains, the plains are quite high above the sea; but near the coast there is a strip of low, level land known as the *coastal plains.*

Other low land is found along the Mississippi River, where there are broad flood-plains protected from the river floods by banks, called *levees.* Notice especially the Mississippi delta, and explain how it happens that the land projects so far into the gulf. (See pp. 46 and 47.)

We observe, then, that in this group of states are some mountains; between these and the coast are high plains or *plateaus;* then along the coast are low plains. Let us see what these three sections produce.

Coal and Iron. — Coal and iron are found among the Appalachian Mountains here, as in Pennsylvania. You would expect from this to find manufacturing centres near the mountains; and BIRMINGHAM, ATLANTA, CHATTANOOGA, and KNOXVILLE are engaged in manufacture. Find each and tell what state it is in.

FIG. 141.

Children playing on a bag of cotton, just picked.

Cotton. — On the plains the soil is usually fertile, the climate is warm, and there is plenty of rain everywhere excepting in western Texas and Oklahoma. For these reasons farming is the chief occupation. The southern farms are commonly called *plantations*, and the principal crop on the higher plains, away from the coast, is cotton.

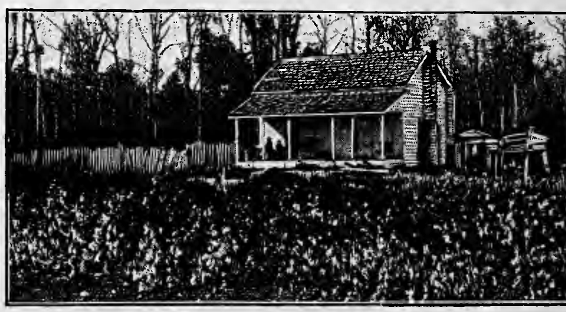


FIG. 142.

A small cotton-field

The cotton plant grows to an average height of two to eight feet. It has a white blossom, and after the flower is gone a small pod, called

the *boll*, grows. This boll enlarges until it ripens, when it bursts, revealing a mass of fluffy white fibres, called *cotton*.

The cotton is picked in the autumn by men, women, and children, and then placed in a machine called the *cotton-gin;* this separates or combs the cotton from the seeds. The cotton is then packed in bales like hay, and shipped away to be made into thread, cotton cloth, and other goods. Name more of them. Name some of the cities in New England where this manufacturing is carried on (see p. 147). The seeds are ground, and furnish a valuable oil, cattle food, and fertilizer.

Corn and wheat are also grown upon these higher plains, and tobacco, especially in the northern part of this section.

FIG. 143.

Great bunches of cattle feeding on the ranches of the arid plains of the west.

Ranching. — The drier plains of western Texas are covered with grass, which furnishes food for herds of horses, cattle, and sheep. The work of raising these animals is, therefore, one of the most important industries of this state. The section of land over which a man's cattle roam is not called a farm or plantation, but a *cattle ranch*, and the business is known as *ranching*.

Since a few men can look after several thousand horses, cattle, or sheep, few people are needed to carry on ranching. On that account there are not many towns in the western part of Texas, as you can see on the map. DALLAS and FT. WORTH are the principal centers of trade for this region.

FIG. 144.
Cutting sugar-cane in Louisiana.

Sugar and Rice. — On the low, swampy plains near the coast and along the lower Mississippi River, rice and sugar-cane are raised. Rice seeds grow on a grasslike plant in wet soil. Sugar-cane looks much like corn; but the juice of the stalk is so sweet that it can be made into sugar and molasses.

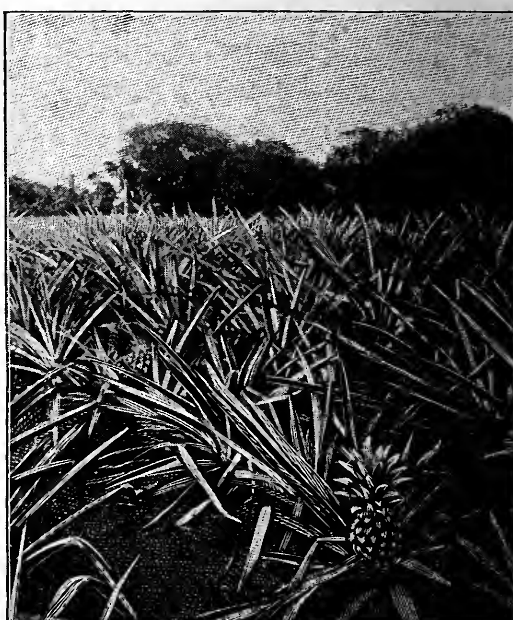


FIG. 145.
A pineapple field in Florida.

Fruits. — Besides the crops mentioned, the low plain of Florida produces fruits. It is so far south that its climate is warm enough for oranges, lemons, and pineapples; probably your grocery store has such fruits from Florida and California.

Lumbering. — Some of these plains, both the high and the low ones, are still wooded. It is from them that the hard or *Georgia* pine, so often used in floors, is obtained. There are forests also in the mountains, so that there is an abundance of timber in this region. Which Northern

state already studied has a large amount of timber? In what section would you expect the climate to prevent the growth of forests?

Manufacturing. — Knowing what is produced in the Southern states, we naturally expect much manufacturing. There are coal, iron ore, corn, wheat, sugar-cane, cattle, sheep, cotton, and lumber, from each of which useful articles can be made. Tell what they are. There is also water-power in many places.

For a long time most of the manufacturing in the United States was done in New England. Great quantities of cotton and other *raw products* were sent there from the South to be manufactured. Then some of the finished articles were brought back for use in the South.

This condition has now greatly changed. The Southern states still ship much cotton to New England and Europe, but much is retained for manufacture at home. No other part of the country has shown so rapid progress in manufacturing as the Southern states. They are one of the greatest cotton-manufacturing regions in the world.

Near the coal fields important iron and steel manufacturing industries have arisen; near the forest regions are many lumber mills. The abundance of coal, iron, and lumber has made possible the manufacture of farm implements and other articles of iron and wood. Each year the importance of manufacturing in the South is rapidly increasing.

The variety of manufactures is far too great to list. Besides articles of iron, wood, and cotton, tobacco is made into many forms; wool into cloth and other woollen goods; hides into leather; cotton seed into cotton-seed oil; sugar-cane into sugar and molasses; the sap of the pine tree into turpentine, tar, and rosin.

New Orleans. — The principal cities in the South are those that have grown up at the best shipping points,

that is, on the ocean harbors, on the rivers, or on some of the great railways.

The greatest city in this entire section is NEW ORLEANS, in Louisiana, on the Mississippi River about one hundred miles from its mouth.

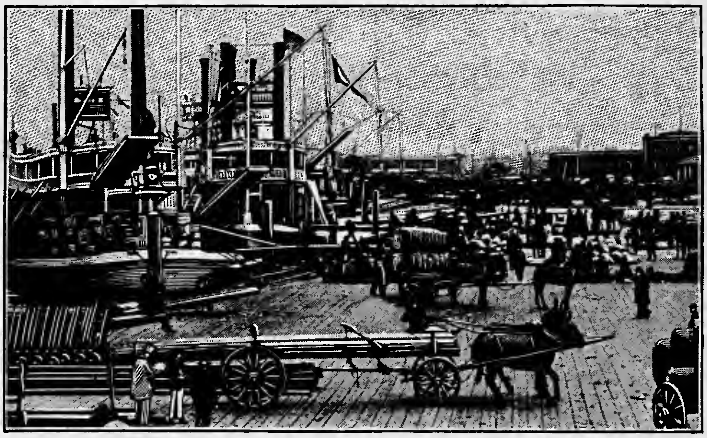


FIG. 146.

Loading and unloading goods on the levee at New Orleans. Notice the mules, one of the most common draft animals of the South.

Like New York it can be reached not only by railway, but also by vessels from across the Atlantic Ocean, and by others from distant inland cities. Ocean ships are able to pass up the river from the Gulf; and river boats can reach it from cities far up the Mississippi and its tributaries. Find some of these cities, such as Pittsburg and St. Louis (Fig. 124). Measure the distance from New Orleans to Pittsburg.

These facts help to explain why New Orleans is a great cotton-shipping port. Quantities of cotton-seed oil, sugar, molasses, and rice are also sent from there. Manufactured goods, as cloth and shoes, and foods, as meat and corn, are brought to this centre, and there distributed in all directions. Further up the river are VICKSBURG and MEMPHIS, which are important river ports.

Other Seaports. — Not many large cities are found on the Gulf coast. One reason is that the entrances to the harbors are often blocked by sand-bars. Also, since there are so few people and cities inland, there is no reason for having many great cities on the coast.

The largest seaport west of New Orleans is GALVESTON. What goods are probably shipped from this harbor? Remember the low coastal plains and the high dry plains to the west.

Along the coast east of New Orleans are MOBILE, a great cotton port, TAMPA, and PENSACOLA, a lumber port. Why lumber? On the Atlantic coast are JACKSONVILLE, the chief shipping port for Florida oranges, SAVANNAH, CHARLESTON, and WILMINGTON. Find each of these and tell what state it is in. In the interior are ATLANTA, COLUMBUS, and AUGUSTA.

FIG. 147.
Some of the Indians who live in Oklahoma.

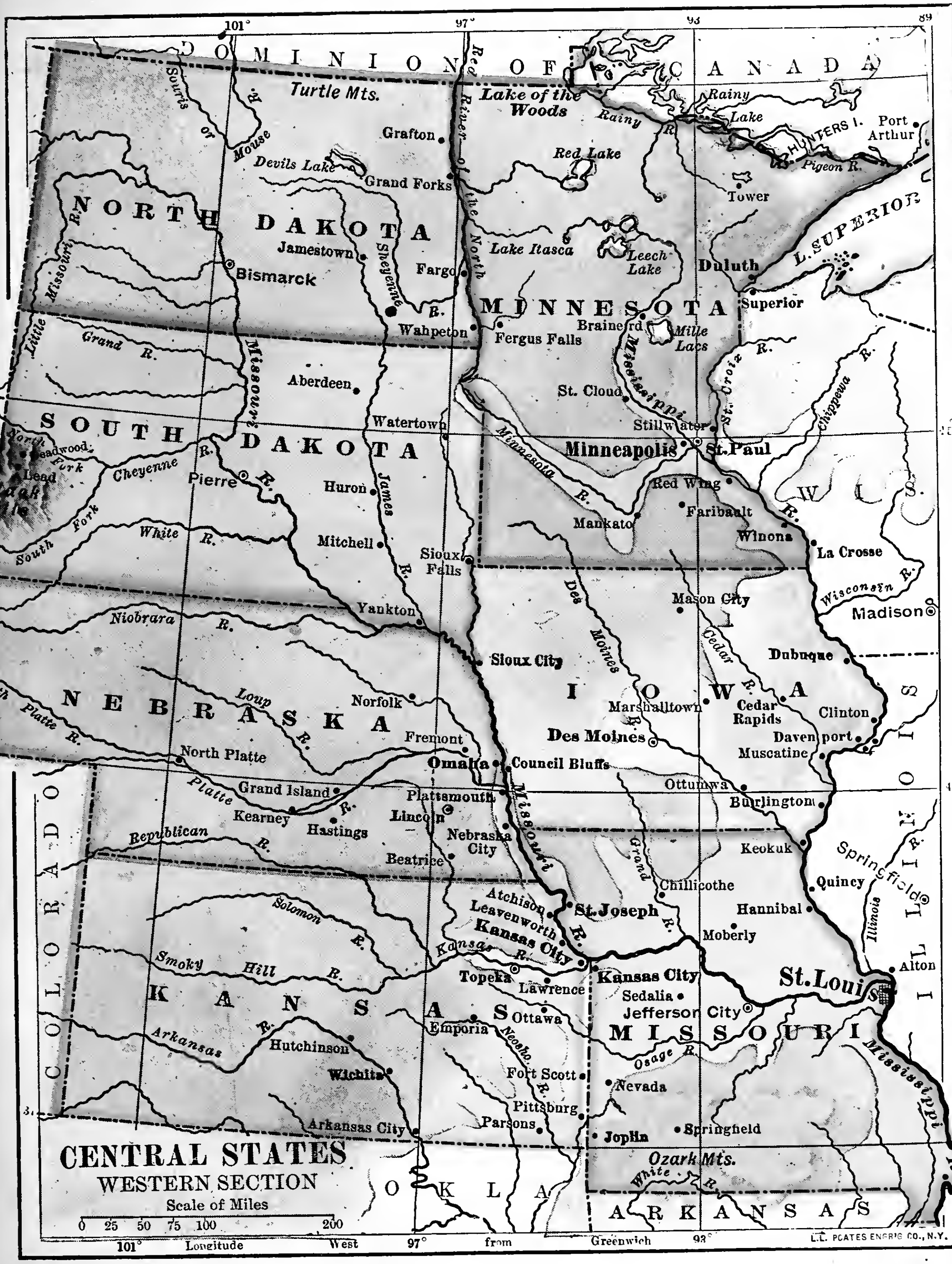
Oklahoma. — A few years ago the section north of Texas, now called Oklahoma, was known under the name of Indian Territory, a place set aside by our government as a home for some of the tribes of Indians. But later, these Indians were collected in the eastern part of Indian Territory. The western part was called Oklahoma Territory and was opened up to white people for settlement. Later the two territories were united in the new state of Oklahoma.

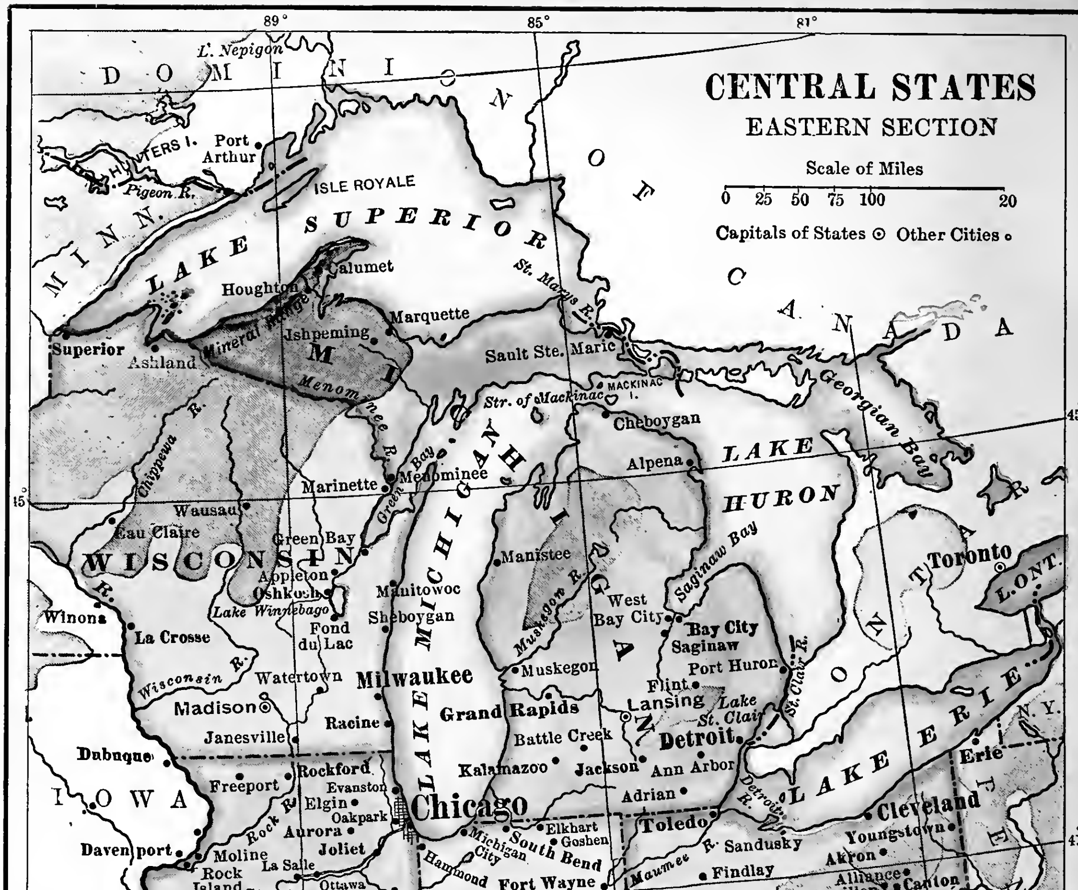
Climate. — The climate of the Southern states is so mild that many Northern people go South in winter to escape the cold. In the Southern part it rarely snows, and flowers are in blossom in midwinter. Do you know why the song-birds of the North go there in winter?

Review Questions. — (1) In which Southern and Northern states are the Appalachian Mountains found? (2) Tell what you can about the Southern plains. (3) Near what cities are coal and iron ore mined? (4) Name and describe the chief crop on the higher plains. (5) What is done with the cotton after it is picked? (6) What is the occupation of the people in western Texas? Why? Why so few towns there? (7) What two products are raised on the warm coastal plains and flood-plains? Describe each. (8) What fruits are raised in Florida? Why raised there? (9) What about the lumber industry? (10) Why should one expect to find much manufacturing there? (11) What kinds are there? (12) Why not more? (13) Why are there so few large cities? (14) Which is the largest of all? Why? (15) What goods reach this port? Why? (16) Name and locate the principal seaports. (17) Make a list of the Southern cities studied, and locate each. (18) Tell the direction of each from New Orleans. (19) Tell something about Oklahoma.

Suggestions. — (1) Draw the coast-line of these states. Add the rivers, the state boundaries, and principal cities. Put in the capitals. (2) Represent the group in sand, showing the mountains and plains. (3) Examine some cotton. Make a collection of articles made from cotton and add them to the school collection. (4) Inquire of your groceryman where his oranges and other fruits were grown. (5) Examine some rice. (6) You can plant and grow not only wheat, but rice, cotton, sugar-cane, and other plants in the schoolroom, especially if you can induce some one who has a hothouse to allow you to start them there. (7) Why is not New Orleans as large as New York? (8) How are the people of New England and those of the Southern states dependent upon each other in the work that they do? (9) Beginning with the New England states, name those thus far studied that have mountains in them. (10) Name and locate the chief cities in all these states. (11) Draw the entire Eastern coast-line, and put in the larger cities and rivers.

For References, see page 259.


CENTRAL STATES
WESTERN SECTION
Scale of Miles
0 25 50 75 100 200
Longitude West from Greenwich
101° 97° 93° 89°
DOMINION OF CANADA
NORTH DAKOTA
SOUTH DAKOTA
NEBRASKA
KANSAS
MINNESOTA
IOWA
MISSOURI
COLORADO
OKLA
ARKANSAS
ILLINOIS
Turtle Mts.
Lake of the Woods
Rainy Lake
Rainy R.
Port Arthur
Pigeon R.
Tower
L. SUPERIOR
Duluth
Superior
Red Lake
Lake Itasca
Leech Lake
Mille Lacs
Brainerd
Fergus Falls
St. Cloud
Stillwater
Minneapolis
St. Paul
Red Wing
Faribault
Mankato
Winona
La Crosse
Minnesota R.
Mississippi
St. Croix R.
Chippewa R.
Wisconsin R.
Madison
Grafton
Devils Lake
Grand Forks
Jamestown
Bismarck
Fargo
Wahpeton
Sheyenne R.
Red River of the North
Souris or Mouse R.
Little Missouri R.
Grand R.
Missouri R.
Aberdeen
Watertown
Huron
Mitchell
Sioux Falls
Yankton
Pierre
Deadwood
Lead
Black Hills
North Fork
South Fork
Cheyenne R.
White R.
James R.
Niobrara R.
Sioux City
Norfolk
Loup R.
North Platte R.
North Platte
Fremont
Omaha
Council Bluffs
Grand Island
Platte R.
Kearney
Hastings
Plattsmouth
Lincoln
Nebraska City
Beatrice
Republican R.
Mason City
Des Moines R.
Cedar R.
Dubuque
Marshalltown
Cedar Rapids
Clinton
Des Moines
Davenport
Muscatine
Ottumwa
Burlington
Keokuk
Grand R.
Chillicothe
Quincy
Springfield
Hannibal
Illinois
St. Joseph
Atchison
Leavenworth
Kansas City
Moberly
Alton
Solomon R.
Smoky Hill R.
Kansas R.
Topeka
Lawrence
Kansas City
Sedalia
St. Louis
Jefferson City
Ottawa
Emporia
Neosho R.
Arkansas R.
Hutchinson
Wichita
Osage R.
Fort Scott
Nevada
Pittsburg
Parsons
Arkansas City
Joplin
Springfield
Ozark Mts.
White R.
Mississippi R.
L.L. POATES ENGR'G CO., N.Y.


CENTRAL STATES
EASTERN SECTION
Scale of Miles
0 25 50 75 100 20
Capitals of States ⊙ Other Cities •
89°
85°
81°
Longitude West from Greenwich
D O M I N I O N O F C A N A D A
L. Nepigon
HUNTERS I.
Port Arthur
Pigeon R.
ISLE ROYALE
LAKE SUPERIOR
MINN.
Calumet
Houghton
Marquette
Mineral Range
Ishpeming
Superior
Ashland
St. Marys R.
Sault Ste. Marie
MACKINAC I.
Str. of Mackinac
Cheboygan
Georgian Bay
LAKE HURON
Alpena
Menominee R.
Green Bay
Menominee
Marinette
Chippewa R.
Wausau
Eau Claire
WISCONSIN
Green Bay
Appleton
Oshkosh
Lake Winnebago
Fond du Lac
Manitowoc
Sheboygan
Winona
La Crosse
Wisconsin R.
Watertown
Milwaukee
Madison
Janesville
Racine
LAKE MICHIGAN
MICHIGAN
Manistee
Muskegon R.
Saginaw Bay
West Bay City
Bay City
Saginaw
Muskegon
Port Huron
St. Clair R.
Flint
Lansing
Lake St. Clair
Grand Rapids
Battle Creek
Detroit
Kalamazoo
Jackson
Ann Arbor
Adrian
Toronto
L. ONT.
ONTARIO
LAKE ERIE
N.Y.
Erie
Detroit R.
Dubuque
IOWA
Freeport
Rockford
Evanston
Elgin
Oakpark
Chicago
Rock R.
Aurora
Joliet
Davenport
Moline
Rock Island
La Salle
Ottawa
Streator
Kankakee
Michigan City
Hammond
South Bend
Elkhart
Goshen
Fort Wayne
Toledo
Maumee R.
Sandusky
Findlay
Cleveland
Youngstown
Akron
Alliance
Canton
Massillon
East Liverpool
PENN.
Galesburg
Peoria
Logansport
Marion
Lima
Mansfield
OHIO
Steubenville
Keokuk
Bloomington
Lafayette
Muncie
Piqua
Newark
Wheeling
ILLINOIS
Illinois R.
Anderson
Columbus
Zanesville
Quincy
Springfield
Danville
INDIANA
Richmond
Springfield
Dayton
Scioto R.
Marietta
Hannibal
Jacksonville
Decatur
Indianapolis
Hamilton
Chillicothe
Parkersburg
Kaskaskia R.
Terre Haute
Cincinnati
WEST VIRGINIA
Wabash R.
Portsmouth
Ironton
Alton
Covington
Madison
Newport
Ohio
Charleston
St. Louis
East St. Louis
Big Sandy R.
Gt. Kanawha R.
MISSOURI
Belleville
Jeffersonville
New Albany
Frankfort
Huntington
Evansville
Louisville
Lexington
Mississippi R.
Kentucky R.
Henderson
Owensboro
KENTUCKY
Ohio
Green R.
Mammoth Cave
Cairo
Paducah
Tennessee R.
Cumberland R.
Bowling Green
Middlesboro
Cumberland Mts.
VIRGINIA
New Madrid
ARK.
TENNESSEE
Nashville
Knoxville
N. CAR.
37°
41°
42°
45°

XII. CENTRAL STATES

Map Questions. — (1) Name the states in this group. (2) Which ones border on the Great Lakes? How can goods be shipped from them by water to New York? (3) Name the Great Lakes. Which is highest above the level of the ocean? Which is lowest? (4) Into what do they empty? (See Fig. 123.) (5) What are the chief rivers in this group? (6) Into what do their waters empty? (See Fig. 124, opposite p. 141.) (7) Which states drain mainly into the Missouri River? (8) Into the Mississippi? (9) Into the Ohio? (10) Which one into the Great Lakes? (11) Find Chicago. Can you think of any reason why it should be a great city — the greatest in this section? (12) In which of these states did Abraham Lincoln live?

Raw Products. — This group of states has four cities larger than New Orleans, two that are almost as large, and several others that are not very much smaller. These facts tell us that there are many more people here than in the Southern states, and that the industries must be far more extensive. Let us see what they are.

Fig. 149.
A "bunch" of cattle on a farm in western Kansas.

The entire section, as you see, is mainly a great plain, whose soil is favorable to farming.

In the western part of Kansas, Nebraska, and the two Dakotas this plain is dry, like the western part of Texas.

The reason for this is that the winds from the Pacific Ocean lose their moisture as they pass eastward over the mountains, while those from the Gulf of Mexico and Atlantic rarely reach so far as this region. On that account the men of this section, as in western Texas, are principally engaged in raising cattle (Fig. 156), sheep, and horses.

The eastern part of the states from North Dakota to Texas has more rain; and since the soil and climate are favorable, it is a great wheat region, the best in the entire country.

Fig. 150.

Harvesting wheat on one of the great wheat fields of the Red River Valley of North Dakota.

In Kentucky, as in Virginia, tobacco is one of the most important products; but in the Central states perhaps the most valuable farm crop is corn. A great deal of that grain is raised in every one of these states, although Iowa and Illinois produce the largest amounts. In many localities so much is raised that the cornfields extend as far as the eye can reach.

In all of these states there is much stock, each farmer usually keeping a few horses, cattle, sheep, or hogs. Each state, likewise, produces wheat and other kinds of grain, as well as wool, hay, fruit, vegetables, and other crops. Ohio is especially noted for its sheep and wheat.

Underneath the soil in several of the states, especially in Illinois, Ohio, and Indiana, coal is mined. Look on

Fig. 151.

Iron mining in the famous Mesabi district of Minnesota, where they shovel out car-loads of the ore with great steam shovels, as gravel is often shovelled.

the map (p. 155) to see in what states coal occurs. In Ohio and Indiana, petroleum and natural gas are found.

On the north-western shore of Lake Superior, in Minnesota, and also on the southern side, in Wisconsin and Michigan, iron ore is mined, as in Pennsylvania and Alabama. In fact, that region produces more iron ore than any other in the world. A great quantity of copper is also mined in Michigan.

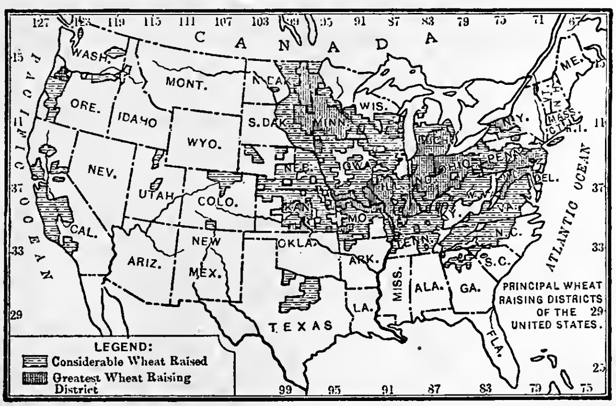


Fig. 152.

Make a list of the wheat-producing states.

The northern parts of Minnesota, Wisconsin, and Michigan also have large forests, so that many kinds of lumber are secured from them.

Now we know the principal raw products of the soil and mines of this region. We find cattle and sheep in the dry western section, wheat in the northwest and in Ohio, copper and iron ore along the shores of Lake Superior, lumber in the north, tobacco in the south, corn in the centre, and a vast amount of coal in several of the states. Many of the people of these states are engaged in obtaining these raw products.

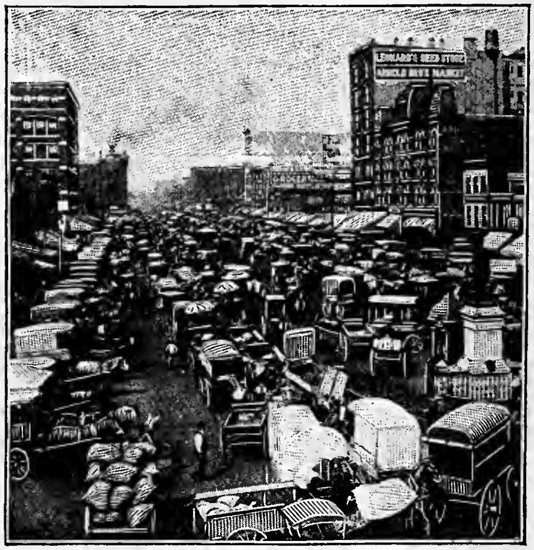


FIG. 153.
Market Street in the great city of Chicago.

The Manufacturing and Trade Centres.— From this it is easy to see the reason for so many people and great cities in this region. The statement was made at the beginning of this section that four cities here were larger than New Orleans, and several others about as large. Where should they be located? Heretofore we have found the *great* cities where goods can be shipped by water; accordingly we would expect to find them either on the shores of the Great Lakes or along the Mississippi River and its tributaries.

Let us study about some of these cities, starting first with CHICAGO. It is next to New York in size, and is

situated on the southwestern end of Lake Michigan in Illinois. It has water connections with New York City, as you know, and also with the cities along the St. Lawrence River; for there is a canal leading from Lake Erie to Lake Ontario in order to avoid the Niagara Falls.

Aside from that, since Lake Michigan extends so far south, the railways from the Dakotas, Minnesota, Wisconsin, northern Iowa, and Illinois must swing around this southern end in going east and southeast. This makes that point a great railway centre.

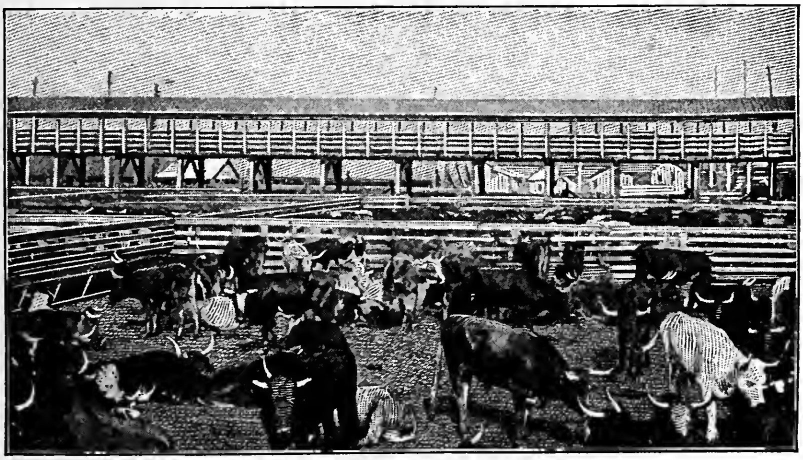


FIG. 154.
Cattle in the Chicago stock-yards.

MILWAUKEE, farther north on the lake shore, is much smaller than Chicago, but it is one of the two cities nearly as large as New Orleans.

What, now, are likely to be the industries of these two cities and the others along the Great Lakes. Quantities of the raw products named are sent to Chicago. It is the greatest meat-market in the world; and cattle and sheep from the Western plains, and hogs from all over the Central states, are shipped to the Chicago stock-yards (Fig. 154),

where thousands of men are employed in preparing them for food. The business of packing, canning, and shipping the meat requires a great number of workmen, and the tanning of the hides to make leather, which is done in Milwaukee, also keeps many men busy.

Some of the wheat of the Dakotas and Minnesota is sent to Chicago and Milwaukee to be shipped or to be ground into flour for bread. The latter city has long been noted for its flour-mills. But there are also great flour-mills nearer the wheat fields. In southeastern Minnesota

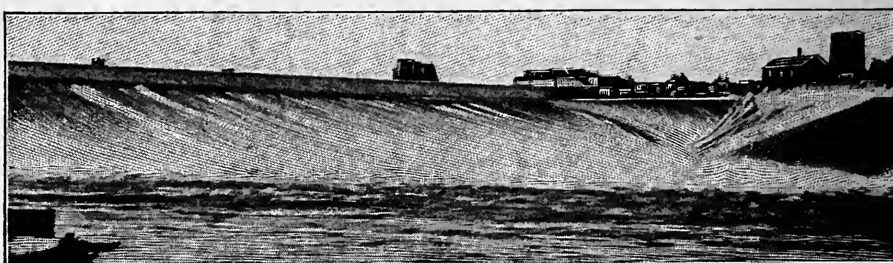


Fig. 155.

St. Anthony Falls, in the Mississippi, around which Minneapolis has grown. These falls furnish power for a number of great flour-mills.

are falls in the Mississippi River (Fig. 155) which furnish excellent water-power, so that flour-mills have been built there and the city of Minneapolis has grown up about them.

Only a few miles away, at the head of navigation on the Mississippi, is St. Paul, which owes its growth partly to the fact that it is a centre for the sale of machinery, clothing, and other articles needed by the farmers who raise the wheat. Name some of the articles they need to buy.

While much flour is made in the West, a great deal of the wheat is sent to Duluth, on the western end of Lake Superior, and there shipped over the Great Lakes, whence it goes to New York and even to Europe. Why should Duluth be selected?

Chicago has no water-power for manufacturing, but it is the nearest lake port to the Illinois coal-fields, and draws upon them for fuel to produce steam for factories. Thus it is made a great centre for the manufacture of iron goods and furniture, receiving both iron ore and lumber in lake vessels. But the other lake ports share in this work, especially the great cities of CLEVELAND, DETROIT, and TOLEDO, which are within easy reach of the raw products.

Another important product that reaches Chicago is corn. There it is ground into corn-meal or made into hominy, starch, and other substances. So much corn and wheat are carried there that Chicago is a great grain as well as meat market.

Locate the principal cities along the Great Lakes. Named in order of size they are Chicago, Cleveland, Detroit, Milwaukee, Toledo, and Duluth. In what state is each of these? Also find SAGINAW and GRAND RAPIDS, two important lumber-manufacturing cities.

We said that the other great cities should be looked for upon the water ways formed by the Mississippi River and its largest tributaries. The greatest of these tributaries is the Missouri River, and a very large city, ST. LOUIS, is situated near where it enters the Mississippi.

St. Louis is connected with the country far to the northwest by the Missouri River; with Minneapolis by the Mississippi; with Pittsburg by the Ohio; and on the south with Memphis, New Orleans, and the ocean. Naturally, as people settled here, railways were built, until, like Chicago, it has become one of the great railway centres in the country. Like Chicago, also, it draws to itself all the products that have been named.

Although a great many cattle and sheep reach St. Louis and Chicago, making them important meat-markets, many of these animals are slaughtered near the plains on which they are raised, and that

fact explains the importance of OMAHA and KANSAS CITY. Both these noted meat-markets are on the Missouri River. Horses and wool are also shipped from these cities.

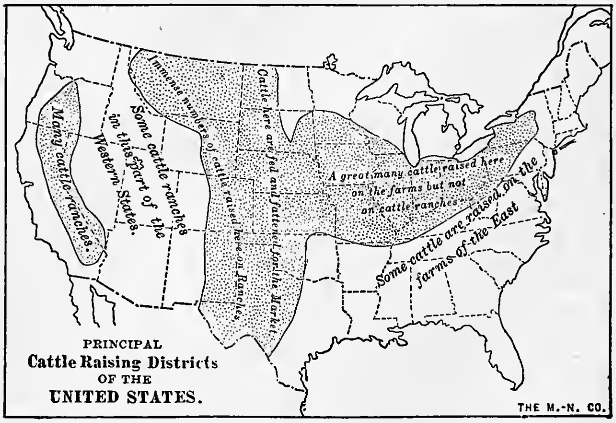


FIG. 156.

Much wheat and corn are brought to St. Louis, making it an important grain-market. A great deal of tobacco also goes to St. Louis; but since Kentucky is the chief tobacco raising state in the Mississippi Valley, its leading city, LOUISVILLE, is the great tobacco market of that section, as Richmond is for Virginia. It is also an important manufacturing centre.

The manufacture of clothing is an important industry in CINCINNATI on the Ohio River, and much machinery is made there from iron ore sent from Pennsylvania and West Virginia. Why from these states rather than from Lake Superior?

One of the largest cities in these Central states, INDIANAPOLIS, the capital and largest city in Indiana, is located away from the great waterways. But it is in a rich farming country, and as railways enter it from all directions, it has become the chief trade centre of that state. COLUMBUS, the capital of Ohio, is another great trade centre.

Locate the principal cities on the large rivers and tell for what they are important. Ranked in order of size they are, St. Louis, Cincinnati, Louisville, Minneapolis, Kansas City, and St. Paul. In which state is each of these?

Review and Comparisons. — We have seen that the farm products and manufactures of the Central states are quite different from those of the Southern states. Make a list of these for each of the groups and compare them. Compare them in the same way with those of New England. With those of the Middle Atlantic states. Explain, as well as you can, the causes for these differences.

Make a list of the six largest cities in each of these four groups of states. When in doubt as to whether one city is larger than another, look up the population in the tables on page 265. Add together the populations of each group of cities and compare the results.

REVIEW QUESTIONS. — (1) Describe the surface of the Central states. (2) What four states are dry in the western part? Why? (3) Compare the products of these with those of western Texas. (4) Where is our greatest wheat region? (5) Where in this group of states are copper and iron ore mined? (6) Where is lumber found? (7) Tobacco? (8) Corn? (9) Coal? (10) For what products is Ohio noted? (11) Give some reasons why Chicago has become so great a city. (12) Also St. Louis. (13) Name and locate the chief cities along the Great Lakes, giving the main industries of each. (14) Do the same with the cities along the great rivers. (15) What was said about Indianapolis and Columbus?

SUGGESTIONS. — (1) Draw the Mississippi River with its two main tributaries. Add to the drawing the Great Lakes and the Atlantic and Gulf coasts. Make a cross where each of the large cities is located, and write its name. (2) Find your own home on this map and notice its direction and distance from some of the large cities. (3) Add some wheat and corn to the school collection. (4) Grow some of each in the school. (5) Tell from what animals wool, beef, pork, mutton, lard, and leather come. (6) Find out about the buffalo and Indians that used to live on the plains. (7) Read about the early French explorers. About the pioneers who first settled these plains. (8) According to the scale of the map (Fig. 124) how does Kansas compare in size with Connecticut? (9) With the whole of New England? (10) Estimate the entire length of the Mississippi River according to the scale on Fig. 124. (11) Draw a map of the Central states similar to that of New England, and put in the capitals.

For REFERENCES, see page 259.

XIII. WESTERN STATES

Map Questions. — (1) In what directions do the mountains extend? (2) Name the principal ranges. (3) Which are the chief rivers? (4) Make a drawing of them. (5) In what sections do there seem to be few rivers? (6) What does that suggest about rainfall? (7) Some rivers empty into lakes that have no outlet. What does that suggest? (See p. 55.) (8) How far is it across the United States from the northern to the southern boundary? (9) Measure the length of California. Compare its size with Pennsylvania; with Texas; with Massachusetts. (10) Compare the coast-line with that of New England. What does that suggest about harbors and cities? (11) Where are Denver and San Francisco?

Reasons why there are so Few People. — This group of states is much larger than either of the other four, forming about one-third of the entire United States. But they are thinly settled, having only about one-fourth as many people as the Southern states alone. Two divisions, Arizona and New Mexico, are still territories, because they have so few inhabitants.

One reason they have so few people is that most of the early settlers came from Europe, and naturally located in the Eastern and Southern states. It was only after these parts were fairly well occupied that many people moved farther westward.

Another important reason is the mountainous condition of the country. Much of this section is a vast, dry plateau, usually more than a mile above the level of the sea. Extending across the plateau from north to south are


WESTERN STATES
Scale of Miles.
0 50 100 200 300 400
State Capitals: ⊙
Other Cities: •
125°
120°
115°
110°
105°
50
45
40
35
30
115° Longitude West 110° from Greenwich 105°
M-N. CO.
DOMINION OF CANADA
PACIFIC OCEAN
VANCOUVER ISL.
Vancouver
Victoria
Str. of Juan de Fuca
C. Flattery
Bellingham
Port Townsend
Everett
Puget Sound
Seattle
Tacoma
Olympia
Mt. Rainier
WASHINGTON
Spokane
Spokane R.
Astoria
Portland
Columbia R.
Snake R.
Lewiston
The Dalles
Mt. Hood
Salem
Albany
Lagrande
Baker City
Cascade
OREGON
Ashland
Owyhee R.
Kalispell
Wallace
Great Falls
Missoula
Milk R.
Missouri R.
MONTANA
Helena
Anaconda
Butte
Billings
Bozeman
Yellowstone R.
Miles City
Bitter Root Mts.
Rocky
IDAHO
Boise
Snake R.
Pocatello
YELLOWSTONE NATIONAL PARK
Big Horn R.
Powder R.
Little Missouri R.
Buffalo
Fremont Pk.
WYOMING
North Platte
Rawlins
Laramie
Cheyenne
N. DAK.
S. DAK.
Black Hills
Cheyenne R.
NEB.
Mt. Shasta
Cape Mendocino
Eureka
Coast
Sacramento R.
Sierra Nevada
CALIFORNIA
Humboldt R.
Great Basin
Great Salt Lake
Bear L.
Logan
Ogden
Evanston
Great Salt Lake Desert
Salt Lake City
Provo City
Utah L.
Wasatch Mts.
UTAH
Sevier Lake
Green R.
Grand R.
Reno
Virginia City
Eureka
L. Tahoe
Carson City
Austin
Sacramento
NEVADA
San Francisco
Oakland
Stockton
San Jose
San Joaquin R.
Coast Range
Fresno
Mt. Whitney
South Platte R.
Denver
COLORADO
Leadville
Colorado Springs
Pikes Peak
Cripple Creek
Pueblo
Arkansas R.
Blanca Peak
Trinidad
Durango
San Juan R.
Grand Canyon
Little Colorado R.
Colorado R.
Flagstaff
Santa Fe
Las Vegas
Albuquerque
NEW MEXICO
Mohave Desert
Pt. Conception
Santa Barbara
Los Angeles
San Bernardino Range
SANTA BARBARA ISLANDS
San Diego
ARIZONA
Phoenix
Salt R.
Gila R.
Yuma
Tucson
Tombstone
Roswell
Silver City
Las Cruces
El Paso
Rio Grande
TEXAS
LOWER CALIFORNIA
Gulf of California
MEXICO

Fig. 157.

several great mountain ranges. The mountains along the Pacific coast are called the *Coast Ranges*, those in eastern California the *Sierra Nevada*, and those farther north, in Oregon and Washington, the *Cascade Ranges*. Far east of these long chains are others called the *Rocky Mountains*. All of these mountains together are known as the *Western Cordilleras*.

The Cordilleras are far higher and steeper than the Appalachians in the East, and they are very rocky, so that farm-

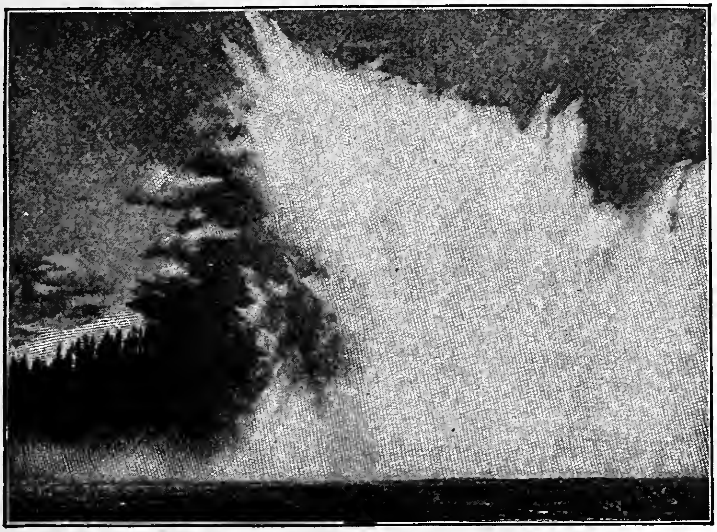


FIG. 158.
A geyser in eruption in the Yellowstone National Park.

ing is impossible on much of the land. Indeed, in many parts they are so rough that it is difficult to travel among them; this is indicated by the name Rocky Mountains.

Still another reason why there are so few people is that, even where the soil is fertile, the climate is usually too dry for farming, because the winds that reach it do not carry much vapor.

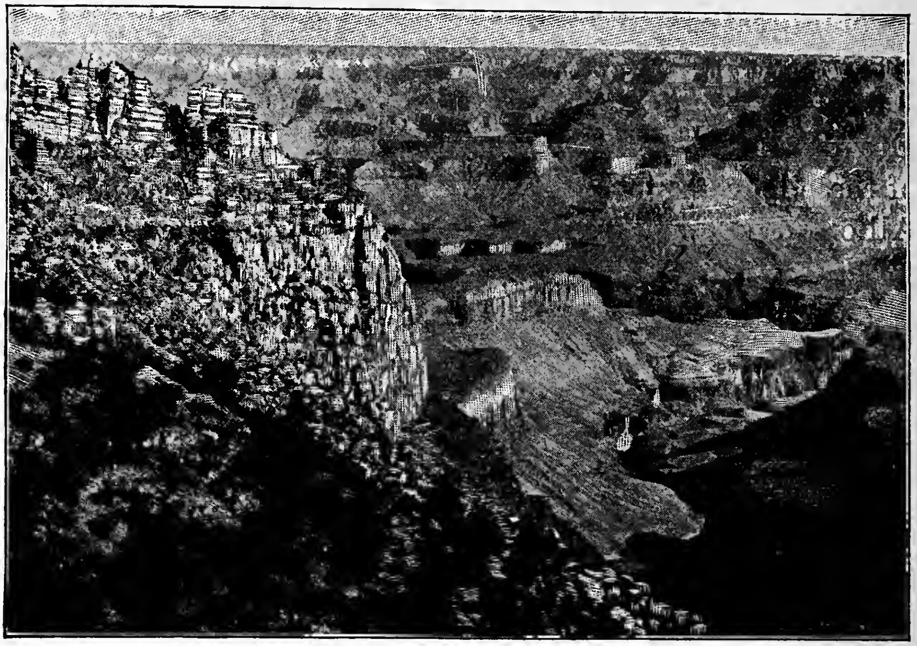


Fig. 159.

A view in the great Colorado Canyon, where the Colorado River flows in a deep gorge cut in the plateau to a depth of over a mile.

Wonderful Scenery. — Some of the places in this section are among the most interesting in the world. For example, in northwestern Wyoming are hundreds of springs where the water is so hot that it boils. At some points boiling water and steam occasionally shoot upward with a roar, from holes in the ground, and rise frequently to a height of one or two hundred feet. These are called *geysers* (Fig. 158), and there are scores of them in this region.

Here, too, is the Yellowstone River, whose waters tumble 308 feet in a single fall, which is nearly twice as high as the Niagara Falls in New York. In the deep gorge that the river has cut below the falls, the rocky banks are

in places fully one-fourth of a mile high and beautifully colored. Our nation has set aside this wonderful region as a park, naming it the *Yellowstone National Park;* and each year hundreds of people travel there to see it.

There are many other interesting places to visit in this western country; but none are more wonderful than the Colorado Canyon (Fig. 159), an immense river valley cut in the rocks of the plateau, in places to a depth of over a mile. Trace its course on the map.

Mining. — Although so rocky and so arid, there are some very important industries in the Western states; and in order to find out what they are, let us first study the mountains. You remember that iron ore and coal are found in the Appalachians; do you remember in what states? Some coal and iron ore are also mined in the Cordilleras; but even more valuable minerals than these are found in the mountain rocks.

In 1848 gold was discovered in California. Bits of this heavy metal lay in some of the stream beds, and could be obtained by carefully washing the lighter dirt away (Fig. 160). News of the discovery quickly spread throughout the world, and men hastened to the gold fields by thousands. Ever since then California has been one of the leading states in the production of gold.

FIG. 160.
Miners washing, or "panning," gravel to see if there is any gold in it.

There were no railways then in the West, so that some men from the East crossed the plains and mountains in wagons, in which they were in danger of being attacked by savage Indians; others made

the long journey in vessels. What route must they have taken? The best harbor on the Pacific coast was San Francisco Bay, where a small Spanish town had existed for years. Soon people crowded in so rapidly that the town of SAN FRANCISCO became a great city and the chief trade centre in the West.

The metal was also found under the soil in the midst of solid rock. Rock with gold in it is called gold *ore*, and must be crushed into fine bits before the gold can be collected. This requires much machinery, and is one of the important parts of mining (Fig. 22, p. 24). A great deal of this kind of ore is now mined in California.

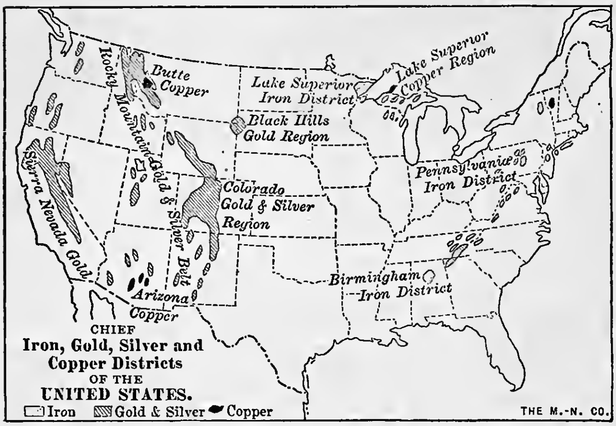


FIG. 161.

In what states is each found?

Gold is also found in Colorado, and many men have been attracted to that state, as formerly to California. Indeed more gold now comes from Colorado than from California. DENVER, the largest city in Colorado, and PUEBLO, owe their growth partly to the gold mines near them. Find these cities on the map.

Silver is another precious metal mined in the West, and Colorado produces more of it than any other state. Without doubt some of the gold and silver that you have seen came from the mountain rocks of California or Colorado. For what purposes are these metals used?

Large quantities of both metals are also mined in the other states and territories of this section, especially in the Black Hills of South Dakota, in Montana, Nevada, and Utah.

Much copper is mined in the West, especially at BUTTE, Montana, where the greatest copper mines in the world are situated, and in the territory of Arizona. Lead is a fourth important metal obtained from these Western states.

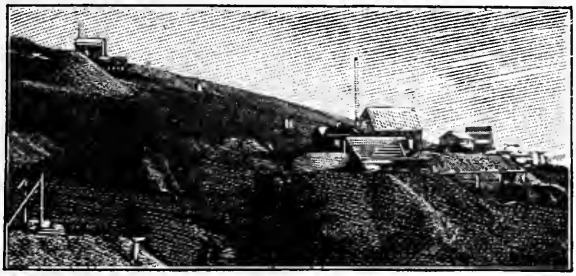


FIG. 162.

These piles of dirt and rock are the waste dumped aside by miners as they have dug into the earth for ore.

Cities have grown up near some of these mines; but there are many mines in the mountains far away from the cities. In some parts of the country travellers may see, from the car windows, scores of little tunnels dug into the sides of the mountains, by men who were hunting for ore. It is a hard, lonely life, and many find little ore; but one occasionally makes a discovery that brings him a fortune.

Ranching. — The mountains, therefore, are chiefly valuable for their ores; but the high plains and plateaus also have some worth. There is little rain upon them; but, as in the western part of the two Dakotas, Nebraska, Kansas, and Texas, there is often grass enough for raising cattle, sheep, and horses. Many of the animals raised are finally shipped eastward to furnish meat, leather, and wool. In these states the cowboys live, spending most of their days upon their horses.

Fig. 163.
A western cowboy.

The Desert. — In some parts of this dry, or *arid*, region there is so little rain that it is a true *desert*. One can travel for scores of miles and see scarcely any vegetation excepting cactus, a little grass, and such plants as grow in arid regions. There are no trees; there is no water; in fact, there is little but sand and rock to be seen! No wonder that many a family, with their horses or oxen, died of thirst and hunger in attempting to cross this desert waste in search of California gold fifty years ago.

Irrigation. — However, by irrigation (see p. 48) parts of these deserts are changed into gardens. To irrigate the thirsty soil, which is usually fertile, men dig ditches and lead the water from streams that are fed by the rain and melting snow of the high mountains.

The Mormons of Utah, a people who were driven out of the Eastern states many years ago, and who settled in that barren region, have changed the desert to a garden by means of irrigation. They have also built the beautiful Salt Lake City near Salt Lake; and not far away

from this is OGDEN, a busy railway centre, where there are not so many Mormons. Find these places on the map.

People living near the eastern base of the Rocky Mountains raise much of their food by the aid of irrigation. Near Denver is a great irrigation ditch leading from the mountains; and while the land just above the level of the ditch is fit for nothing but grazing, that below it, which can be flooded with the water, produces excellent crops.

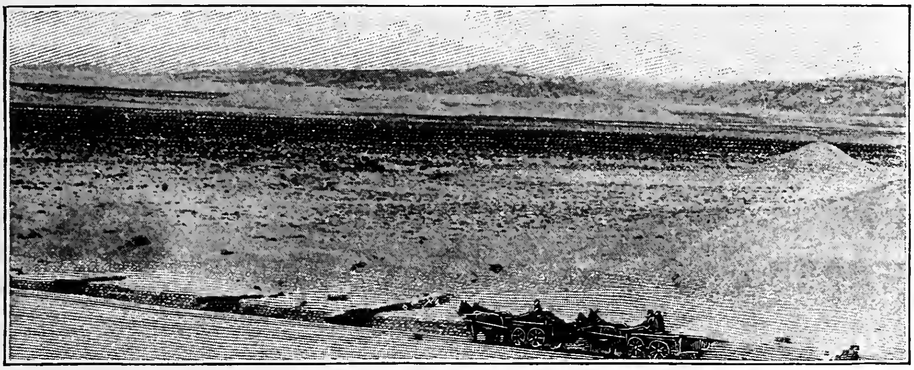


FIG. 164.
The desert of Utah, near Great Salt Lake, where there is no fresh water, where it rarely rains, and where there is very little vegetation.

Irrigation is growing more common every year, and by the aid of it people often raise food for stock, as well as for themselves. They even build great reservoirs to collect the water for use in the summer (Fig. 49, p. 53); but most of this barren waste can never make good farm land, because there is not enough water.

Fruit Raising. — We have been studying the mountains, high plains, and plateaus, finding mining and grazing to be the chief industries, with farming where the soil is irrigated.

Let us now examine the land nearer the coast. Southern California also has an arid climate where farming cannot be carried on without irrigation. But since the climate of the region is warm, as in Florida, the fruits that grow in southern countries, such as oranges, lemons, peaches, olives, and figs, are easily raised.

FIG. 165.

An orange grove near Los Angeles in Southern California, the irrigation ditch being seen between the two rows of orange trees.

In the midst of this beautiful fruit country, where the climate is so fine, is the beautiful city of LOS ANGELES, an important railway centre, surrounded by thriving towns and orange groves (Fig. 165). Everywhere in that vicinity the main work is fruit raising by aid of irrigation. Without it a piece of land produces no crops, while a well-irrigated orchard by its side thrives wonderfully well. Visitors are usually surprised to see such a striking difference.

Industries along the Pacific Coast. — Farther north, toward San Francisco and beyond it, the rainfall is heavier; but irrigation is necessary in many places. The most common fruits are grapes, plums, peaches, and apricots. Much wheat is also raised, and sheep are numerous. This is the country of "big trees," too, the largest in the world being found in the vast forests among the mountains.

Still farther north, between Oregon and Washington, you will find a large river on the map. What is its name? Here the moist winds from the ocean cause heavy rainfall, so that irrigation near the coast is unnecessary. On the mountain slopes are extensive forests, and there are large lumber mills, especially in Washington along Puget Sound. Find this sound (Fig. 124).

In this section there are many cattle and sheep ranches, and quantities of wheat are raised. The raising of such fruits as peaches and apples is also an important industry. Salmon are abundant in the Columbia River, so that the fishing industry is important there, as at Gloucester, Massachusetts. What kinds are caught there? (See p. 143.)

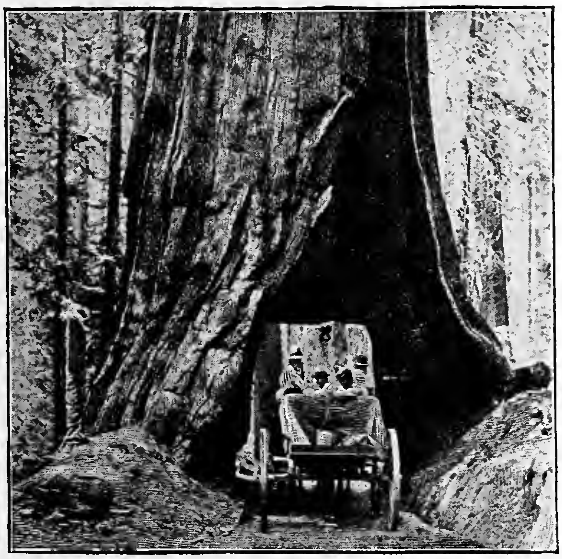


Fig. 166.

One of the "big trees." Notice that through a hole cut in the trunk a large wagon can be driven.

The Cities of the Pacific Slope. — The largest city north of San Francisco is Portland, on a small branch of the Columbia River. It is situated about one hundred and twenty miles from the mouth of the Columbia, and can be reached by ocean vessels. The other cities are Tacoma and Seattle on Puget Sound, and Spokane, a manufacturing centre, at the falls in the Spokane River.

Comparing the Pacific with the Atlantic coast, one sees some striking differences. The Atlantic coast is low and extremely irregular, having many bays and fine harbors, with numerous great cities about them. But the Pacific coast has steep mountains in many places, and, except in the very north, is regular, having few fine harbors and large cities. San Francisco is the most important, being larger than New Orleans. Los Angeles is twenty-five miles away from the coast; but Portland, Tacoma, and Seattle are all seaports.

From the four coast cities and from Los Angeles, goods are shipped over the Pacific Ocean to Japan, China, Australia, and even around South America to the Atlantic coast. This is an important trade, but it is by no means so extensive as the ocean commerce of the Atlantic coast cities. The fact that we now control the Philippine and Hawaiian islands will cause this trade to increase; and when a ship canal connecting the Atlantic and Pacific oceans is finished, there will be still more ocean commerce. Why? A cable has recently been laid from San Francisco to Manila by way of Honolulu. Of what benefit is it?

At present the greater part of the products of the Western states, even of the coast cities, instead of being shipped by water, are sent eastward by rail. There are railway lines connecting each of the large Western cities with all portions of the Eastern states.

Review Questions. — (1) Compare the size of this group of states with that of the other groups. (2) What about the number of people there? (3) Give three reasons why there are so few. (4) Name each of the mountain ranges, finding each on the map, Fig. 124. (5) Tell what a visitor may see in the Yellowstone Park. Where is it? (6) Where is San Francisco? What caused its early rapid growth? (7) Where is Denver? Give a reason for its importance.

(8) What metals are obtained in the West? (9) Where is each found? (10) Tell what you can about each. (11) What is the principal industry on the high plains and plateaus? Why? (12) Why cannot the whole desert be irrigated? (13) What city have the Mormons built? Where is it? (14) Where is Los Angeles? (15) What is raised near there? Why? (16) What is raised in other parts of California? (17) Name the products of Oregon and Washington. (18) Where is the chief city in Oregon? Why there? (19) What are the chief cities in Washington? (20) Name the cities on the Pacific coast having excellent harbors. Name several on the Atlantic. (21) How do the two coasts differ? (22) Where are the products of the Pacific coast sent? How?

(23) Make a list of the principal cities studied in the United States. (24) In what direction is each from Chicago? (25) Make a map of the United States, placing on it each of the states with their names. Put on the map the names of the capitals. (26) Which states have a seacoast?

SUGGESTIONS. — (1) Write a story describing a journey across the plains and mountains to California in the early days. (2) Make a list of articles made of gold; of silver; of copper; of lead. Collect some ores of these for the school. (3) What stories have you read about the life of cowboys? About the Western Indians? (4) Find out something about the Yosemite Valley. (5) Ask a storekeeper what California fruits he keeps. Find out what products of your county are shipped to other states or countries. (6) Visit a fish-market to see some salmon. Find a picture of one in the dictionary. (7) Add together the population of the five largest cities on the Pacific coast. Compare that number with the population of the five largest on the Atlantic coast. You will find a table giving population of cities on page 265. (8) Make a drawing of the Pacific coast, showing the cities. Add the rivers. (9) Find out what large animals live among the mountains. (10) What is the distance from San Francisco to New York? (11) Past what cities must the waters of the Yellowstone River run, in flowing to the Gulf of Mexico? Through what states? (12) Ask the railroad agent in your town for illustrated circulars descriptive of western scenery, or write to San Francisco to the general offices of the different roads.

For REFERENCES, see page 260.

XIV. ALASKA

ALASKA, which you see on the map (Fig. 123, opposite p. 140), although a part of the United States, is a great distance from us. Our country purchased this cold, barren land from Russia. It is so far north that it is partly in the arctic zone, and many people thought that our government wasted the $7,200,000 that was paid for it.

FIG. 167.

A street in Sitka, Alaska. Although it is summer, notice the snow on the mountains.

But Alaska has proved valuable in several ways. During the last few years thousands of men have gone there in search of gold, just as years ago thousands rushed to California. You have probably heard of the famous Klondike region, where so much gold has been found. The

Klondike is a stream flowing into the Yukon River just east of the boundary line between Alaska and Canada. Find it. The Klondike region itself is in Canada.

Much gold is also mined on the coast just north of SITKA, the capital of Alaska, and in other places as well. But the country is so far north that little food can be raised, and mining in many parts is not only difficult but dangerous.

FIG. 168.
Some of the fur-seal on the Pribilof Islands.

Much sealskin for cloaks and caps comes from Alaska. A few hundred miles southwest of the mouth of the Yukon River are the small Pribilof Islands, to which thousands of seals come every spring to rear their young. Seal hunters are allowed by the government to capture some of these for their fur, which is warm and beautiful, but very expensive because the animals are not abundant.

There are great forests in some parts of Alaska, and the fishing is good. Not only is Alaska valuable at present, but it will probably be even more valuable in the future.

REVIEW QUESTIONS.—(1) Where is Alaska? (2) In what zones? (3) How did we obtain it? (4) What is done there?

SUGGESTIONS.—(1) Draw the Yukon River. (2) Measure its length and compare it with that of the Mississippi. (3) How does the coast compare with that of California? Of Maine? (4) Read something about the fur-seal. Examine some fur. (5) Find out something about a journey to the Klondike.

For REFERENCES, see page 260.

XV. CANADA AND OTHER COUNTRIES NORTH OF THE UNITED STATES

Map Questions. — (1) How far are Detroit, Buffalo, and Chicago from Canada? (See map opposite p. 167.) (2) What Falls in the river which connects Lakes Ontario and Erie? (3) What effect have they upon shipping? (4) In what part of Canada would you expect to find most of the people? Why? (5) What large bay in northeastern Canada? (See map opposite p. 140.) (6) What can you say about the climate of the country north of this? (7) Which of the Great Lakes is entirely within the United States? (8) Into what large river do the Great Lakes empty?

Canada and Newfoundland

Industries. — Canada is a British colony; and Newfoundland and Labrador also belong to England, but are separate from Canada.

Much of this region is cold and bleak; but the southern part resembles the northern United States in climate and soil, so that the products on the two sides of the boundary may be expected to correspond.

Fishing was found to be an important industry along the New England coast (p. 143); so it is, also, in Nova Scotia and Newfoundland.

Maine in the East and Washington in the West are covered with vast forests. Forests extend into Canada, covering a large part of it, and in fact they reach northward for several hundred miles until the climate becomes so cold that trees can no longer grow.

New York and Ohio are noted for their fruit, dairying, and farming. Ontario, or that part of Canada just north of these states, has the same products.

The best wheat fields in the United States are in Minnesota and the two Dakotas; so Manitoba is the best wheat region in Canada. And since the dry plains of the Far West also extend into Canada, cattle and sheep raising are important industries on the plains of western Canada, even to the base of the Rocky Mountains.

The western mountains of the United States contain much gold, silver, and other metals; it is the same with the mountains of Canada. The Klondike region should be remembered as a part of Canada, although it was mentioned in connection with Alaska. (See p. 188.)

Since we know the principal products, let us locate the chief lines of transportation and cities. Canada, like the United States, has a water-route to the ocean. This is partly along the Great Lakes and partly along the St. Lawrence River, one of the great rivers of the continent; but in some places, as at Niagara, it is necessary to pass for short distances through canals. One of the largest of these is the Welland Canal, which connects Lakes Erie and Ontario. Point it out on the map opposite page 167.

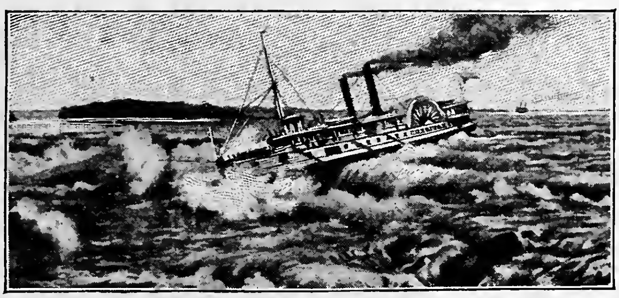


FIG. 169.

The Lachine Rapids on the St. Lawrence, just above Montreal. There is one place down which a steamer can come; but no vessel can go up the rapids. Do you see how this has helped to determine the location of Montreal?

Cities. — The eastern part of Canada is most thickly settled, like the eastern part of the United States, and for the same reasons. What are they? Along the water-route just mentioned are some very large cities, as in the United States. The largest is MONTREAL, which is nearly as large as New Orleans. Like that city, Montreal is situated on a river at a point where ocean vessels can reach it. Farther down the St. Lawrence is the old city of QUEBEC, founded many years ago by the French. OTTAWA, the capital, is west of Quebec, on Ottawa River, and TORONTO is across Lake Ontario from Niagara Falls. Find all these (Fig. 123).

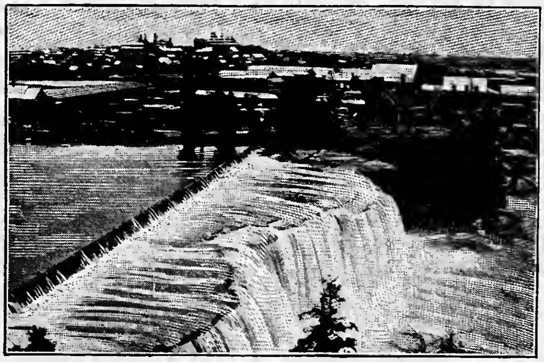


FIG. 170.

Waterfall at Ottawa. The city is seen behind the fall. How has the fall helped to determine the location of Ottawa?

As there is much water-power and coal in eastern Canada, there is a great deal of manufacturing in the cities, especially in Montreal and Toronto.

The cities not on this water-route are smaller. HALIFAX, in Nova Scotia, has an excellent harbor. WINNIPEG, the main city in the wheat region of Manitoba, is connected with the Pacific coast at VANCOUVER and the Atlantic at ST. JOHN by the great Canadian Pacific Railway. From Vancouver and VICTORIA, as from Seattle, Tacoma, Portland, and San Francisco, goods are shipped to Australia and Asia.

The Far North. — In the vast forests of northern Canada live few other people than hunters, trappers, and Indians.

Along the northern coast are found scattered groups of Eskimos, who get their living almost entirely from the sea. Their food is

obtained from the seal, walrus, polar bear, and reindeer; their clothes, summer tents, and boats are made from the skins of these animals; and their oil for light and heat during the long winter night also comes from them. Their winter houses are snow huts, and long journeys over the ice-covered seas are made on sledges drawn by wolf-like dogs.

FIG. 171.
An Eskimo boy from Baffin Land, dressed in his summer furs.

ISLANDS NORTH OF NORTH AMERICA

The islands north of North America are desolate lands. In winter the sea is frozen; and even in summer floating ice is usually in sight. Some of the ice is that which has frozen on the surface of the sea during the winter; but rising above this are many great blocks of ice, or *icebergs*, sometimes two hundred or three hundred feet in height. They have broken off from the streams of ice, called *glaciers*, that move down from the land and enter the sea. The immense island of Greenland is almost all covered by such glaciers. No land can be seen excepting near the coast, where some Eskimos live and a few Europeans, called Danes, from Denmark. The island belongs to the Danes, who purchase skins, oil, etc., from the Eskimos.

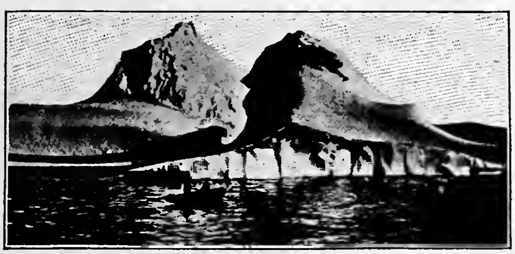


FIG. 172.
An iceberg from the great Greenland glacier.

Review Questions. — (1) Show how the products of Canada correspond with those of northern United States. (2) Where is the St. Lawrence River? Walk in the direction in which it flows. (3) Where does the water come from? (4) Through what waters must a vessel pass in going from Duluth to the Gulf of St. Lawrence

Fig. 173.

Cutting ice from the St. Lawrence River opposite Montreal. What effect should you think this thick ice would have on the commerce of Montreal?

and the ocean? (5) Name and locate the chief cities along this route. (6) Where is the largest city? Why there? (7) Where is Ottawa? Halifax? (8) Name two cities on the western coast. (9) Tell about the people living in northern Canada. (10) How are icebergs caused? (11) Make a drawing of the Great Lakes and St. Lawrence River, putting in the cities.

Suggestions. — (1) What difficulty do you see in building the Welland Canal? How is it overcome? (2) What difficulties should you think the Canadian Pacific Railway would have in running trains in winter? (3) Why is not Hudson Bay an important outlet for goods by water from Canada? (4) How can you explain the fact that there are no large cities along the great Mackenzie River? (5) Find out something about Quebec. (6) Write a story about the Eskimos. (7) Collect pictures of scenes in Canada. (8) Read Longfellow's poem, "Evangeline"; the land of Evangeline is in Nova Scotia.

For References, see page 260.

XVI. COUNTRIES SOUTH OF THE UNITED STATES

Map Questions. — (1) What does the map (Fig. 123, opposite p. 140) tell you about the highlands and lowlands in Mexico? (Notice the rivers.) (2) Find the capital of Mexico. (3) Why is Central America a fitting name for the region southeast of Mexico? (4) Point toward Cuba. (5) How far is Havana from Florida? From New Orleans? (6) What large islands in the West Indies? In what zone are they? (7) What large peninsulas are in Mexico?

Mexico and Central America. — As Canada is colder than the United States, so the countries south of us may be expected to be warmer. Notice that a large part of Mexico is south of the Tropic of Cancer and that Central America is entirely south of it.

Fig. 174.

Popocatepetl, an extinct volcano, not far from Mexico City, and one of the highest mountain peaks on the continent. Notice that the top is white with snow, although in the torrid zone.

Near the seacoast of Mexico the land is low and the climate hot; but in the interior are many mountains and broad, arid plateaus. They are a continuation of those in our Western states, and are so high that the climate is cool.

Some of the highest mountain peaks are old volcanoes made of lava that has poured forth from the earth. These peaks are so high that they are always covered with snow, in spite of the fact that they are in the torrid zone.

With such a variety of climate we shall of course find a variety of products. Much of the mountain region is too cold and rocky for farming; but, as in Colorado, these mountains yield valuable metals, especially silver.

Fig. 175.
A street in a Mexican town.

Part of the Mexican plateau is dry, like western Texas and some of the other Western states. Name some of them. Like these, its value consists largely in wild grass, on which great herds of cattle, sheep, and horses feed. Of what use are these animals? In other parts of the plateau there is enough rainfall for farming; but in most places crops can be raised by the aid of irrigation only.

Along the lowlands of the coast, the rainfall is heavy, and the products are much the same as on the low, damp plains of our own Southern states. What are they? (See pp. 160 and 162.) Besides these, much coffee is grown on the slopes between the coastal plain and the high plateau. Have we found that product before in North America?

There is very little manufacturing in these countries, for two reasons. One is that coal is lacking. Why is that a good reason? The other is that many of the people are too ignorant to manage machinery.

The Spaniards once owned this part of North America, and their language is still spoken there. Most of the people living in Mexico and Central America are either pure Indians, or else Spaniards with Indian blood in their veins, called *half-breeds*. Only about one man in six is a full-blooded Spaniard.

Mexico is now a republic, like the United States, and its capital is the city of MEXICO. The coast on the east is regular, as you can see, so that there are few harbors. VERA CRUZ is the chief port, but the harbor is poor.

Central America is made up of several republics, each having a capital of its own. Many of the people are very ignorant, and there are frequent revolutions, when ambitious generals try to overthrow the government.

At the present time Central America and the Isthmus of Panama are of interest because a canal is being dug there, to save vessels the long journey around South America. Examine the map (Fig. 120, opposite p. 137) to see how much distance will be saved in this way between New York and San Francisco. In Central America are dense tropical forests from which hard woods, dyes, rubber, and other valuable products are obtained.

The West Indies and Bermuda.—Besides the countries on the mainland of the continent there are numerous islands, some of which form an *archipelago* called the West Indies. They are really the highest parts of mountain ranges projecting above the sea and so arranged as to separate the Caribbean Sea from the Gulf of Mexico and from the Atlantic Ocean. All of them have a tropical climate.

The largest island is Cuba, where sugar, tobacco, and tropical fruits, such as bananas, are raised. HAVANA is its capital and largest seaport. Cuba belonged to Spain until

our recent war with Spain, and so did Porto Rico, which now belongs to the United States.

The other large islands are Jamaica, belonging to England, and Haiti, where there are two negro republics. The large islands are called the Greater Antilles; and the small islands, extending in a chain from near Porto Rico to the South American coast, are called the Lesser Antilles. These belong to England, France, and other European nations.

FIG. 176.

A field of Easter lilies in the Bermuda Islands, where these lilies are raised for export to the United States at Easter.

Off the eastern coast of Florida are the low Bahama Islands; and in the open Atlantic, far to the northeast of these, is a tiny cluster called the Bermuda Islands. Both belong to England, and are made of coral sand, as described on page 135.

REVIEW QUESTIONS. — (1) Tell about the climate and relief of Mexico. (2) About the industries. (3) About the inhabitants. (4) What cities are there? (5) For what is Central America especially important at present? (6) Tell what you can about the West Indies. (7) The Bahamas. (8) The Bermudas.

SUGGESTIONS. — (1) What reason can you see for digging the Nicaragua Canal at the place where it is shown on the map? (2) Why are there no large rivers in Mexico? (3) Find out about the Panama Canal. (4) Tell some of the events that happened in Cuba during our war against Spain. (5) Find out what you can about Cuba; about Porto Rico. (6) In what time of year would it be best for people to visit these islands? (7) Why can potatoes, onions, and other vegetables be grown in Bermuda so early as to reach us in March? (8) Ask some one who has been to the Bermuda or Bahama Islands to tell you what he saw there.

For REFERENCES, see page 260.


Longitude West 60 from Greenwich
CARIBBEAN SEA
Pt. Gallinas
Cartagena
Colon
PANAMA CANAL
PANAMA
Panama
ISTHMUS OF PANAMA
Valencia
La Guaira
Maracaibo
Caracas
TRINIDAD (Br.)
Orinoco R.
VENEZUELA
Magdalena R.
Georgetown
Paramaribo
Cayenne
BRITISH
DUTCH
GUIANA
FRENCH
Bogota
COLOMBIA
Mouths of the Amazon
EQUATOR
Quito
Cotopaxi, Vol.
Chimborazo, Vol.
Guayaquil
ECUADOR
Rio Negro
Amazon R.
Pará
Maranhão
Marañon R.
Madeira R.
BRAZIL
Cape St. Roque
Pernambuco
Andes
PERU
Lima
Callao
Tocantins
São Francisco
Bahía
Titicaca L.
BOLIVIA
La Paz
Arequipa
Sucre
Iquique
Paraguay R.
Paraná R.
Rio de Janeiro
São Paulo
C. Frio
TROPIC OF CAPRICORN
Pilcomayo R.
PARAGUAY
Asuncion
Uruguay R.
Porto Alegre
URUGUAY
Montevideo
Cordoba
Valparaiso
Aconcagua Vol.
Santiago
Rosario
Buenos Aires
La Plata
Plata R.
JUAN FERNANDEZ I. (Chile)
Colorado R.
CHILE
ARGENTINA
PATAGONIA
PACIFIC OCEAN
ATLANTIC OCEAN
SOUTH AMERICA
Scale of Miles.
0 100 500 1000
Capitals
Other Cities
FALKLAND IS. (Br.)
TIERRA DEL FUEGO
Strait of Magellan
Cape Horn
SOUTH GEORGIA (Br.)
Comparative Area.
PENN.
45,215 Square Miles.
THE M. N. CO.

FIG. 177.

XVII. SOUTH AMERICA

Map Questions. — (1) Compare the shape of South America with that of North America. (2) What great mountain ranges are there along the western side? (3) Which part of South America has no cold winter? (4) Which part has a climate much like that where you live? (5) What is the name of the longest river? (6) Where do you expect to find the most fertile regions? (7) Name the countries of South America.

Relief. — Great mountain chains were found in the western part of North America. What are their names? Through what countries do they extend? In South America there are also high mountains on the western side, called the Andes. The peaks of the Andes are higher than those in the United States, and there are many active volcanoes among them (Fig. 12).

Fig. 178.

Two tunnels on a railway line that crosses the high Andes of Peru.

Besides the Andes, the map shows a highland region in eastern Brazil and a smaller one between the Amazon and Orinoco rivers, forming the divide between them.

The remainder of South America is mainly lowland, drained by three mighty rivers. What are their names? Where does each rise? In what direction does each flow? Which drains the longest slope?

Climate. — The products of the three valleys greatly depend upon their climate; let us, therefore, see how much heat and moisture they have.

Where does the equator cross the continent? Where does the tropic of Capricorn cross it? How much of the continent, then, is in the torrid zone? Where is the coldest part? In which zone?

From this we see that much more than half the continent must have a warm climate; but that the southern part has a temperate climate more like our own. In which months does summer come to this region?

As for the moisture in the torrid or tropical part of South America the rains are very heavy. The reason for this is that the air becomes heated and is thus made very light; it is then forced to rise to such a height that the vapor is condensed, causing heavy showers. (See p. 77.)

There is less rainfall in the south temperate zone, and still less in the narrow strip west of the central part of the Andes, in Chile and Peru. There the climate is quite arid because the principal winds are from the south and east, so that the air loses its vapor in passing over the mountains and descends upon the Pacific slope as dry, parching winds.

History. — Knowing now the chief facts about the relief and climate, let us look at the countries themselves. After the discovery of South America by Columbus the Spaniards settled in many parts, obtaining great quantities of gold and silver, especially in the Andes. Nearly all of South America once belonged to Spain, excepting Brazil, which was settled and for a long time owned by the Portuguese. Although the South American coun-

tries are now independent nations, the Spanish language is still spoken nearly everywhere excepting in Brazil.

Brazil. — This is the largest country, being even larger than the United States without Alaska; but it has only about one-fourth as many inhabitants. Much of the great Amazon valley consists of forest-covered plains, called *silvas*, in which the trees are so close together, and there is such a mat of vines and underbrush, that it is

Fig. 179.
A path through the dense tropical forest of South America.

extremely difficult for one to make his way through. From what was just said about the climate, you may be able to give the reason for such rank growth.

You will find pictures of some of the wild forest animals in Fig. 109, page 131. What are their names?

Of course this forest is not a good home for men, especially since much of the land is frequently flooded; in fact, Indians are almost the only people living there.

They make a living by hunting, fishing, and selling rubber from the rubber tree that grows in the woods.

Rubber is obtained by cutting a hole in the bark and catching the milky fluid that flows forth. After being warmed over a fire to make it more solid, it is sent down the river in boats to PARA and then shipped to many parts of the world. Bicycle tires and overshoes are made from it. See how long a list of other rubber articles you can name.

Another common tree is the cocoa tree, on which grow the beans from which cocoa and chocolate are made. It is difficult to travel in this great wilderness, where the rivers are almost the only roadways.

Most of the inhabitants of Brazil live in the eastern part along the coast. Some of them are white people, but many are either Indians or negroes, or of mixed blood, as in Mexico. You will notice several cities on the coast, of which RIO DE JANEIRO, the capital, is the largest, being about twice the size of New Orleans. It has a splendid harbor.

There must certainly be some important industries in this region to cause a city to become so large. Besides the raising of cattle upon the plateau of eastern Brazil, farming is an important industry there. The principal crops are the same as those already found in warm countries; namely, cotton, sugar, tobacco, and coffee. The last is most important, and Rio de Janeiro is one of the chief export towns, which is the reason why some of our coffee is called Rio coffee.

Venezuela and Guiana. — North of Brazil is Venezuela, which includes most of the Orinoco valley. Here are broad plains, called *llanos*, which produce excellent grass,

so that cattle raising is one of the important industries. Coffee and cocoa are also raised. The capital and largest city is CARACAS, which is located several miles from the coast upon land more than half a mile above the sea. What advantage do you see in such a position?

FIG. 180.

Native Indian women washing clothes in Venezuela. Do you see in the picture any reason for thinking it is warm there?

Just north of the mouth of the Orinoco River is Trinidad Island, which belongs to Great Britain. On that island is a great pitch lake, from which much of the asphalt used in our street pavements is obtained.

All of the countries of South America are republics excepting Guiana, east of Venezuela, which belongs to three European nations. What are their names? And what is the capital of each section of Guiana? The products of these countries are much the same as those of Brazil and Venezuela.

La Plata Countries. — The country south of Brazil, drained by the Plata River and its tributaries, is one of the most productive parts of South America. Here, at the mouth of the Plata River in Argentina, is BUENOS AIRES, the largest city on the continent. Across the wide river mouth is MONTEVIDEO, another large city, in Uruguay. What other small country lies between Argentina and Brazil?

The plains in this section of the country are called *pampas;* and because of their excellent grass one of the chief industries is ranching. Since most of the country is in the temperate zone, corn and wheat are important farm products; and in the warm northern part, near the tropics, tobacco and sugar-cane are raised. This is the part of South America that most nearly corresponds in climate and products to the United States.

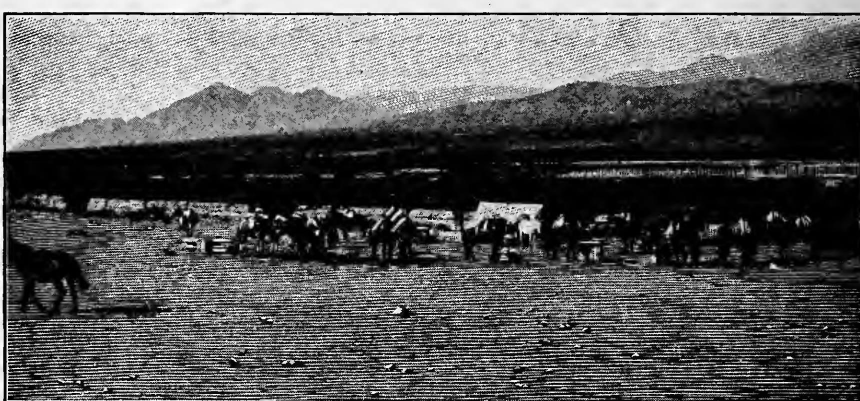


FIG. 181.
A scene on the pampas of Argentina.

Goods are still carried upon the rivers in Argentina, but there are also many railways in that country, — more, in fact, than in any other part of South America.

Andean Countries. — The countries in the western part of South America are very mountainous, since each of them includes a part of the Andean chain. As you might expect, then, one of the principal industries is mining; and immense quantities of gold and silver have been found there. What are the names of these countries?

Observe that most of the cities are not upon the coast. This is partly because they have grown up in the mining

districts among the mountains, and partly because there are so few good harbors. Many of the cities away from the coast have seaports, as CALLAO in Peru, the seaport of LIMA. Find others.

VALPARAISO, in Chile, is the largest port on the Pacific coast; but SANTIAGO, the capital, situated fifty miles inland, and about one-half mile above the sea, is more than twice as large. Notice how long and narrow Chile is: what reason can you give for that?

FIG. 182.
A scene among the lofty, snow-capped mountains of Chile.

Farming is possible in the northern part of the western coast, where the rainfall is heavy; but farther south, as in Peru and northern Chile, agriculture is impossible without irrigation. In southern Chile, however, the rainfall is moderate, and many people have settled there because the farming and grazing are excellent.

Which of the Andean countries has no seacoast? Is that a disadvantage? Ecuador is the Spanish word for equator. Why is that a fitting name for the country? Colombia and Panama have seacoasts on two oceans, and the latter includes the Isthmus of Panama. What cities

do you find on the two sides of the Isthmus? They are connected by a railway. Why is this important?

Review Questions. — (1) Describe the highland regions of South America. (2) What three great valleys are there? (3) In what zones are the different parts of the continent? (4) Which is the rainiest region? Why? (5) What about the rainfall elsewhere? (6) Compare Brazil with the United States in size and number of inhabitants. (7) Tell about the silvas and the valuable products obtained from them. (8) Where are the chief cities in Brazil? Which is the largest? (9) Name the main industries in that section. (10) Where is Venezuela. (11) Tell about the industries there. (12) Where is Caracas? (13) For what is Trinidad noted? (14) Which is the most productive part of South America? What are the products? (15) Name and locate the largest city on the continent. (16) Name the countries along the western side of South America. (17) Why are most of the cities not directly on the coast? (18) Which is the largest port? (19) What are the products of these countries?

Suggestions. — (1) Draw the outline of South America. Put in the drawing the mountains, chief rivers, and cities. Add the country boundaries. (2) Make a sand model of the continent, showing the highlands and lowlands. (3) What large cities were found in the interior of North America? How about South America in that respect? What are the causes for the difference? (4) Brazil is in the torrid zone, while the United States is in the temperate zone. Which country has the advantage in temperature? Why? (5) Write a story telling of a journey by land and river from the mouth of the Orinoco to the mouth of the Plata. (6) Find some pictures from South America and add them to the school collection. (7) Read something about coffee raising. Read about Pizarro. About Bolivar. (8) From the table on page 268 find the five largest cities in South America. Add the populations together and compare the result with the total of the five largest cities in North America (see p. 264).

For References, see page 260.


EUROPE
Scale of Miles
0 100 200 300 400 500 600
Capitals of Countries
Other Cities
ARCTIC OCEAN
ATLANTIC OCEAN
MEDITERRANEAN SEA
ARCTIC CIRCLE
North Cape
Hammerfest
LOFODEN IS.
Lapland
Reikiavik
ICELAND (To Denmark)
Mt.Hecla
FAROE IS. (To Denmark)
SHETLAND IS.
ORKNEY IS.
HEBRIDES
BRITISH ISLES
SCOTLAND
Glasgow
Edinburgh
Newcastle
Leeds
Bradford
Sheffield
Hull
Belfast
Manchester
Liverpool
Dublin
IRELAND
Irish Sea
Nottingham
Birmingham
WALES
Cork
Bristol
ENGLAND
London
Dover
English Channel
North Sea
Trondhjem
Bergen
Christiania
Skager Rack
Cattegat
Gothenburg
DENMARK
Copenhagen
Stockholm
SWEDEN
NORWAY
Kiolen Mts.
G. of Bothnia
Helsingfors
G. of Finland
Finland
Baltic Sea
White Sea
Archangel
Dwina R.
L.Onega
L.Ladoga
St.Petersburg
Valdai Hills
Riga
Duna R.
Vilna
Nijni Novgorod
Volga
Moscow
Tula
RUSSIA
Kazan
Kama R.
Perm
Ekaterinburg
Orenburg
Ural Mountains
Ural R.
Political Boundary of Russia Proper
Tobolsk
Ob R.
Tundras
Petchora R.
Saratov
Volga R.
Astrakhan
Caspian Sea
Kiev
Kharkov
Dnieper R.
Ekaterinoslav
Don R.
Rostov
Sea of Azov
CRIMEA
Odessa
Dniester R.
Pruth R.
Sevastopol
Black Sea
Caucasus Mts.
Mt.Elbruz
Tiflis
Baku
Trans-Caucasia
Mt.Ararat
Trebizond
Constantinople
Bosporus
Sea of Marmora
Dardanelles
TURKEY IN ASIA
Smyrna
CYPRUS (To Gt.Britain)
Comparative Area
PENN.
45,215 Square Miles
ASIA
The Hague
Rotterdam
Amsterdam
NETHERLANDS
Hanover
Hamburg
Elbe R.
Oder R.
Stettin
EMPIRE
GERMAN
Berlin
Magdeburg
Dusseldorf
Leipzig
Dresden
Cologne
Chemnitz
Breslau
Vistula
Warsaw
Poland
Lodz
Antwerp
Str. of Dover
Lille
Havre
Brussels
BELGIUM
Paris
Seine R.
Loire R.
FRANCE
Rhine R.
Frankfort
Prague
Nuremberg
Munich
Danube R.
Vienna
Berne
Zurich
Geneva
SWITZERLAND
Lyon
Mt.Blanc
The Alps
AUSTRIA-HUNGARY
Budapest
Carpathian Mts.
ROUMANIA
Bucharest
Danube
Trieste
Milan
Turin
Venice
Po R.
Genoa
Florence
Rhone R.
Marseille
ITALY
Apennines
Adriatic Sea
Rome
Naples
Mt.Vesuvius
Belgrade
SERVIA
MONTENEGRO
Cettinje
Sofia
BULGARIA
Balkan Mts.
Philippopolis
Adrianople
TURKEY
Salonica
Ægean Sea
Athens
GREECE
CRETE
Bay of Biscay
Bordeaux
C.Finisterre
Cantabrian Mts.
Pyrenees
Oporto
Douro R.
PORTUGAL
SPAIN
Madrid
Lisbon
Tagus R.
Valencia
Barcelona
C.St.Vincent
Guadalquivir R.
Malaga
Str. of Gibraltar
Gibraltar
CORSICA
SARDINIA
BALEARIC ISLES
Palermo
SICILY
Str. of Messina
Mt.Etna
MALTA (To Gt.Britain)
Tunis
Algiers
Fez
Morocco
AFRICA
L.L. POATES ENGR'G CO., N.Y.
Longitude West
Longitude East from Greenwich

XVIII. EUROPE

Map Questions. — (1) On page 132 it was stated that Eurasia consisted of two continents, Europe and Asia. Trace the boundary line between them, naming the mountains and waters that form it. (2) One of the seas has no outlet; which one is it? What kind of water would you expect to find in that sea? (3) How does the coastline of Europe compare with that of South America? Of North America? (4) Would you expect to find many good harbors? (5) Name the largest peninsulas and draw an outline map to show them. (6) Where are the highest mountains? (7) One of the Alpine peaks is Mt. Blanc. What have you already learned about it? (See p. 21.) (8) Where are the plains? Which very large country is made up mainly of plains? Find Sicily and Sardinia. (9) In what zones is Europe. (10) How do you think its climate would compare with that of the United States? (11) With what European country have we recently been at war? (12) What other countries in Europe do you know something about? (13) By what route would you go from New York to one of them? (See Fig. 120.)

Europe is only a little larger than the United States with Alaska, but contains more than five times as many inhabitants, who are separated into a score of nations, with a different language for nearly every one.

I. The British Isles.—The people in Europe to whom we are most closely related live on the small group of islands, called the British Isles, which lie just west of the mainland. This is often called our "mother country." Can you tell why?

There are two islands, Ireland and Great Britain; what are the names of the three parts of Great Britain?

On these islands are fine harbors and many great cities, LONDON, in the southern part of England, on the Thames River, being the largest city in the world. Let us see what the people do.

Judging from their position one might expect these islands to be too cold for agriculture, for they are farther north than the mouth of the St. Lawrence River; but the climate is no colder than that of the northern United States. The reason for this is that the western coast of Europe is warmed by a broad current, or *drift*, of warm ocean water, known as the Gulf Stream, which flows northeast in the Atlantic Ocean from the warm southern seas. The air over it becomes warmed; and, since the winds of Europe blow chiefly from the west, they carry this warmth with them and produce a climate much milder than one would otherwise expect.

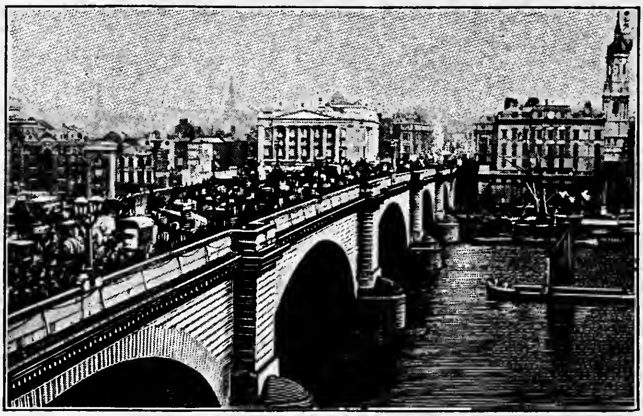


FIG. 184.
London bridge, across the Thames, over which a busy throng is almost constantly passing.

Wales and most of Scotland are too hilly to be well suited to agriculture; but many sheep and cattle are raised. In England there is much more farming, and hay is one of the chief crops, since the damp air and the rain cause the grass to grow well. This is a reason, also, why sheep are raised in great numbers.

But agriculture and stock raising are not the chief occupations. Having much wool, the people long ago

learned to make woollen cloth. In addition to that, they purchased cotton from distant countries, — as New England does to-day from the Southern states, — and made cotton goods. Thus extensive manufacturing industries have been developed, which have been made possible because of the vast beds of coal found there, as in Pennsylvania, Illinois, and neighboring states.

The centre for this manufacturing is MANCHESTER, and the nearest port is LIVERPOOL, thirty-five miles away. Recently a ship canal, called the Manchester Canal, has been built, connecting these two cities. Find them.

The coal has helped to make another great industry possible. Beds of iron ore occur in England, and by the use of coal it is made into iron and steel, especially at BIRMINGHAM, which is the greatest centre for iron manufacturing in Great Britain. Where else have we found a city called Birmingham? What can you tell about it?

The lowland portion of Scotland, about EDINBURGH and GLASGOW, is likewise noted for its cotton and woollen factories, and for its iron manufacturing. Glasgow is the greatest center for steel shipbuilding in the world. What city in the United States is noted for shipbuilding?

Great numbers of people are employed in all this work, so that enough cloth, knives, needles, engines, and so forth are made to supply many parts of the world.

Ireland is not so much interested in manufacturing, although linen is an important product, being manufactured especially at BELFAST. It is really to a great extent a farm for the English, furnishing them butter, eggs, potatoes, and also meat. The air is so moist that the grass

is kept fresh and green, and on that account Ireland is often called the Emerald (or Green) Isle. The two largest cities are naturally on the side next to England. What are their names?

FIG. 185.
Thatched cottages in Ireland.

So many manufactured goods must be shipped away from Great Britain, and so much food imported, that the shipping business is very important. For this reason there are many skilful sailors in Great Britain, and that nation has more ships upon the sea than any other in the world.

Having so many ships, the British have been led to explore countries in all parts of the world. Whenever they discovered new lands, they laid claim to them in the name of their government, and in that way England has come into possession of Canada, Australia, India, several large countries in Africa, and scores of islands. These are called *colonies*, and the British have more of them than any other nation in the world. Indeed, these colonies cover one hundred times as much surface as the British Isles and have ten times as many inhabitants.

LONDON, the capital and the central port for vessels, has an excellent harbor on the Thames River, where hundreds of ships can be accommodated at one time.

Great Britain and Ireland, together with their many colonies, form the *British Empire*. Its government, unlike our own, is a monarchy; but it is very liberal, and

as in our own country, the people have an important share in the making of laws.

II. Norse Countries. — SWEDEN AND NORWAY. These two countries together occupy the Scandinavian peninsula, and are about as far north as southern Greenland. Were it not for the Gulf Stream, which flows past Norway, this, like Greenland, might be a barren, frozen country. As it is, however, many people live there.

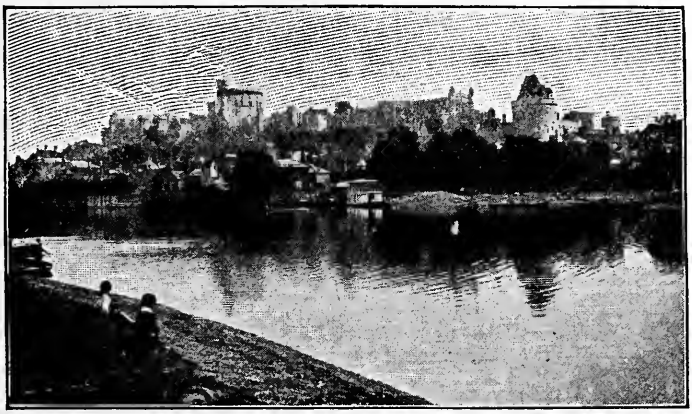


FIG. 186.

The Thames River and Windsor Castle, where Queen Victoria resided.

As in Scotland, most of the country is too hilly and rocky for farming, although some grain, cattle, and sheep are raised, especially on the lower land of southern Sweden along the Baltic. Few people live in the highlands, and about one-fourth of Norway is covered by forests.

The coast is very irregular, and many deep, narrow bays, or *fjords*, reach into the land, making fine harbors. As a result, Norwegians and Swedes are skilful sailors. In the early days these Northmen were the best sailors in the world, and they came to the American shores long before Columbus discovered America. Fishing for cod and herring is now one of their important industries.

The principal cities are STOCKHOLM and CHRISTIANIA. Find each. They are the capitals of Sweden and Norway, two prosperous kingdoms which until recently were under one king.

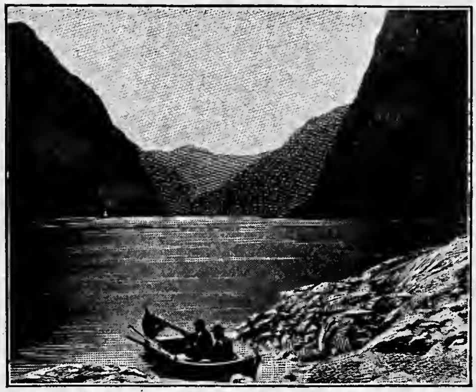


FIG. 187.
One of the deep, narrow fjords of Norway.

DENMARK, just south of Norway and Sweden, is inhabited by people similar to those in Scandinavia; in fact, these three are often called the *Norse* nations, or the nations of the Northmen.

The Danes, also, have been great sailors, and now have possession of Iceland and the west coast of Greenland. Their country presents a very different appearance from Norway and Sweden, for the land is low and level, and farming is the occupation of about one-half the people. Fishing is also an important industry.

FIG. 188.
Danish women selling fish.

The government is a monarchy, the capital and largest city being COPENHAGEN, situated on an island.

III. Russia.—The Russian Empire not only includes great plains in Europe, but extends several thousand miles beyond the Ural Mountains to the

eastern coast of Asia ; it is larger than the whole of the continent of North America and contains a greater number of inhabitants.

Most of Russia in Europe is a level country. The northern part, like northern Norway, is in the frigid zone, and so far away from the Gulf Stream that the climate is extremely cold. The plains there, called *tundras*, are too cold for trees, and the frost never leaves the ground except at the very surface in summer. Nevertheless, a moss flourishes and supports numbers of reindeer, which are used as draft animals by the natives.

The southeastern plains, called *steppes*, are so far from the ocean that the west winds can bring them little rain. They are therefore dry like the arid region in our Western states. But the central and western parts are well suited to farming, and there most of the people live. As in the northern United States, one of their main crops is grain, especially wheat ; and vast numbers of cattle and sheep roam over the broad, grassy steppes.

The rivers are excellent waterways, the largest of all being the Volga, the greatest river in Europe. What others do you find?

Since the Caspian Sea has no outlet, and the Arctic Ocean on the north side is frozen much of the time, the chief ports for foreign commerce must be either on the Baltic or the Black Sea. This explains the location of ST. PETERSBURG, the capital and largest city, which is about the size of Philadelphia. ODESSA, on the Black Sea, contains many flour-mills and is an important port for the export of wheat. With what two cities northwest of Chicago may it be compared?

The chief railway centre is MOSCOW in the interior, which is nearly twice as large as Boston.

The great mass of the people, called *peasants*, are not allowed to take any part in the government, and, unlike most of the Europeans, are kept in ignorance and subjection. They are ruled by a man called the *Czar*, who makes and executes laws very much as he pleases. That kind of government is called an absolute monarchy, or despotism, and is very different from the limited monarchies thus far studied.

FIG. 189.
A family of Russian peasants.

IV. Germany. — The general slope of the land in Germany is shown by the rivers; in what direction do most of them flow? The southern part of the country consists of mountains and highlands, but the northern part is a great plain, a continuation of the plains of Russia.

As in Russia, there is much agriculture, one of the chief products being grain. Much of their bread is made from a grain called rye, and is so dark that it is called "black bread." Beets are grown in enormous quantities, and sugar is manufactured from them as it is from sugarcane in Louisiana. Grapes flourish along the upper Rhine River, and from these wine is made; and more hops for making beer are raised in Germany than in any other country of the world.

Both coal and iron ore are mined in abundance; and many articles are manufactured, such as the famous Krupp guns

and many kinds of machinery. Germany is noted also for its manufacture of cotton, woollen, and linen goods, ranking next to England as a manufacturing country of Europe.

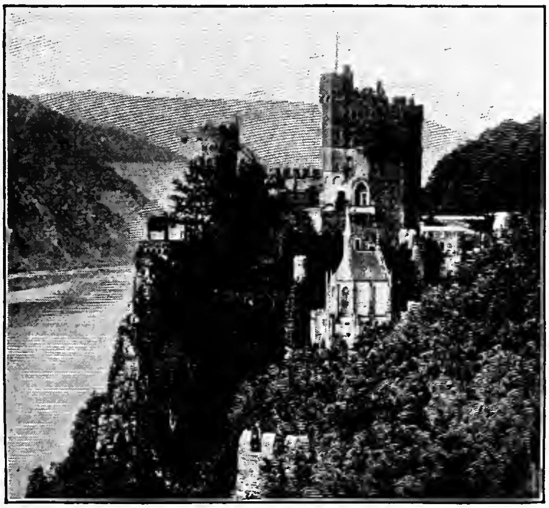


FIG. 190.
A castle on the Rhine.

The chief seaport is HAMBURG on the Elbe River, a city about the size of St. Louis. Why should the chief port be at this point rather than farther east on the Baltic Sea? A ship canal has recently been dug across the peninsula south of Denmark. What are the advantages from it?

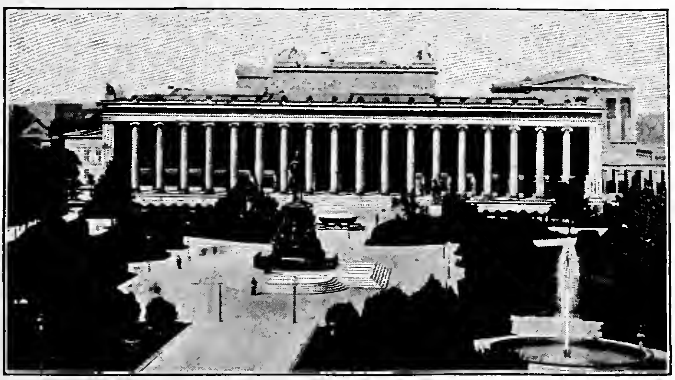


FIG. 191.
The Royal Museum at Berlin.

The schools, universities, and museums of Germany are among the best that exist, and many Americans go to Germany each year to

study music, painting, and other subjects. The largest university is in BERLIN; LEIPZIG also has one, and there are many others. MUNICH and DRESDEN are noted for their fine picture galleries, and so is BERLIN, which also has other large museums. Find these cities.

BERLIN, the capital of Germany, is the largest city. The government is a limited monarchy, and the present ruler is Emperor William II.

V. Holland, or the Netherlands (a word that means *lowlands*), is a low, flat country, much of it being lower than the neighboring sea.

FIG. 192.
A canal in Holland.

The inhabitants have built embankments, called *dikes*, to keep the sea out, and have dug canals across the country to drain it. The water that collects inside the embankments is pumped out by windmills, or by steam, into the canals, and these canals are the chief roads, being used in summer by boats and in winter by people on skates or on sleds.

The damp soil furnishes excellent grass, so that cattle raising and dairying are the principal occupations.

The Hollanders, or Dutchmen, living so near the sea, have become great sailors and explorers, like the Englishmen. For this reason they have come into possession of some of the richest islands in the East Indies, from which are obtained valuable products, such as coffee, spices, and precious stones. On the map, Fig. 221, facing page 249, find the names of some of the Dutch East Indies. Find out about the early Dutch settlements in America. What great city did they settle?

The chief city is AMSTERDAM, with a population of half a million people. The government is a monarchy, and the laws are made at THE HAGUE, on the coast.

VI. Belgium, like Holland, has some land that is lower than the sea and protected by dikes; but the eastern part is much higher.

FIG. 193.
A windmill, in Belgium, like those so common in Holland.

The people are crowded together more closely than in any other country of Europe. Many live on farms and raise much the same products as those of Holland and Germany. What are these?

Flax is an important farm product. It is a plant about two feet high, whose fibre is used in making linen and fine laces. The Belgians have long been skilful in such work, and it was from them that the English received some of their knowledge about manufacturing. BRUSSELS, the largest city, is famous for its fine laces, linens, and Brussels carpets, the latter being made of wool on a mat of linen.

There is a great amount of coal and iron in this little kingdom, so that the iron industry is extensive, as in Germany.

The government is a monarchy with BRUSSELS for its capital. ANTWERP is the chief seaport.

VII. France. — The slope of the land in France you see by the course of its rivers. What are their names? Where do they rise and in what direction do they flow?

In the cool northern part the crops are similar to those of Germany; but in the southern portion the

climate is warmer and the crops somewhat different. Besides grapes, which are grown in great quantities in the region of BORDEAUX, and made into wine that is sold in many parts of the world, much silk is also produced.

Silk is manufactured from cocoons spun by a caterpillar called the *silkworm*. Each one of the cocoons is made of a fine thread several thousand yards long, looking somewhat like the thread of a spider's web.

After the cocoons have been softened in hot water the threads are unwound and then wound upon spools. They are later made into thread and woven into silk cloth, ribbons, handkerchiefs, and other silk goods.

Much depends upon the proper care of the silkworm. Their principal food is the leaf of the mulberry tree, which is planted in great groves in the Rhone Valley, in southern France. The leaves are plucked and fed to the worms.

LYON, the center for the silk industry, and the greatest silk market in the world, is the third largest city in France.

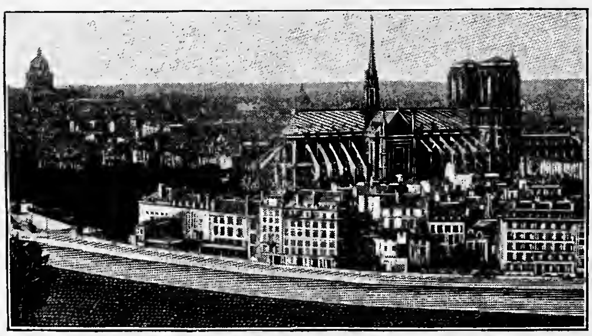


FIG. 194.
A view of the great city of Paris.

PARIS, the largest city in France, is the third in size in the world, and probably the most beautiful. Like several cities in Germany, it has fine picture galleries and museums, and many foreigners go there to study painting, music, and other subjects. It is situated upon the Seine River, and its chief port is HAVRE, at the mouth of the Seine.

BORDEAUX, already mentioned, is an important shipping port for wine, and MARSEILLE is the principal port upon the Mediterranean coast. From these three harbors France ships goods to and from her several colonies and other countries.

FIG. 195.
The harbor of Marseille.

The French government was formerly a monarchy, but is now a republic with PARIS as its capital.

VIII. Spain and Portugal. — The Pyrenees Mountains form the boundary between France and Spain, rising like a great wall to separate the two countries.

You remember that Magellan was a Portuguese and that it was to Spain that Columbus went for help. These were once among the most powerful nations in the world, and they once ruled much of North America and most of South America. Little by little they have lost their colonies in the New World, the last to be taken being Cuba and Porto Rico.

Like Mexico, which was settled and for a long time owned by the Spanish, Spain has a dry, mountainous plateau or table-land in the interior, with low land along the coast.

Being so much like a desert, one would expect few people to make their homes in the interior; and this is the case, although, strange to say, the greatest city,

MADRID, is found in the centre of this table-land. Its importance is due to the fact that it is the capital of Spain.

FIG. 196.
A view of a part of Madrid and the great plateau on which it is situated.

As upon our dry Western plains and plateaus, cattle and sheep raising are important industries on this highland. But the rocks of this region contain its chief wealth, for Spain produces more quicksilver and lead than any other nation, and more copper and iron than most others.

Farming is carried on in the mountain valleys and on the low lands along the coast. One of the most valuable crops is grapes; you have doubtless seen Malaga grapes, named from the city of MALAGA on the southern coast. Many grapes are made into wine; others are dried to make raisins. Other fruits grown here are olives, lemons, oranges, and figs; besides this much cork is obtained from the bark of the cork oak.

BARCELONA, on the eastern side, is the chief port of Spain; and the principal city of Portugal is LISBON, the capital.

Both governments are limited monarchies, like those of most European countries.

IX. Italy was once the most powerful country in the world. Its principal city was ROME, and the Romans ruled nearly all the other countries then known. But, like Spain, it has lost much of its importance.

ROME is still the capital and the residence of the king;

Fig. 197.
St. Peter's Cathedral on the left, and the Vatican, the residence of the Pope, on the right.

also of the Pope, who is the head of the Roman Catholic Church. The city is especially noted for its many ruins of buildings erected hundreds of years ago.

Venice, at the head of the Adriatic Sea, is another interesting city. It is built upon many islands joined by hundreds of bridges, and its chief streets are canals, where boats, called *gondolas*, are used in place of wagons and carriages.

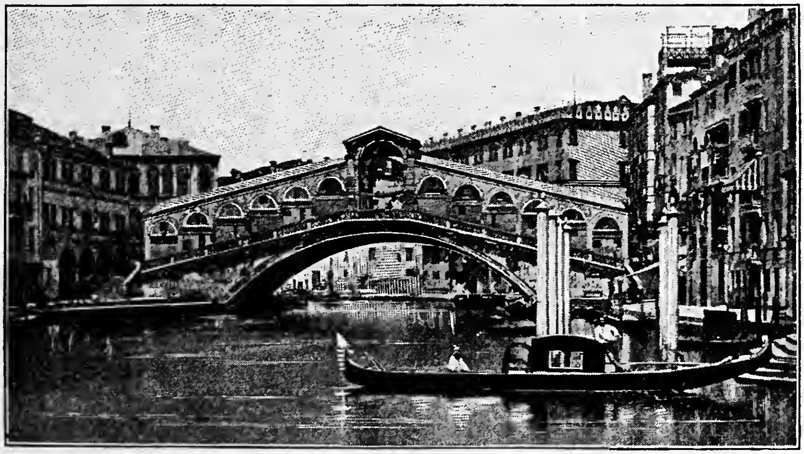


Fig. 198.
One of the canals of Venice, with a gondola floating upon it.

Naples, which is on the coast southeast of Rome, and near Mt. Vesuvius, is the largest city in Italy. The steam

rising from the crater of Vesuvius is easily seen from the city (Fig. 102). Volcanic ash from Mt. Vesuvius has entirely buried some of the towns near by, such as the ancient city of Pompeii, from which the ashes have been dug away so as to bring to light the buried buildings and streets.

The best farm land is in the valley of the Po River in the northern part, where wheat, and other grains, and mulberry trees for silkworms are raised. MILAN, like Lyon in France, is a great centre for silk.

The climate is mild enough to produce the same fruits that are grown in Florida and Southern California. Name some of them.

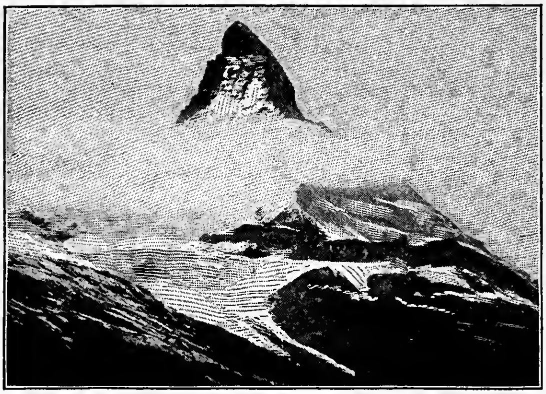


FIG. 199.
The snow-capped Matterhorn, one of the Alpine peaks.

X. Switzerland. — Any one who has heard the story of William Tell, or who has read about the St. Bernard dogs kept by the monks, has some idea of how Switzerland looks. Here are the snow-capped Alps, with many lakes and fertile valleys between them, and views so beautiful that thousands of people go every year to enjoy them (p. 21). One of the occupations of the Swiss is to provide for these visitors in hotels and restaurants.

The green grass in the low-lying valleys and on the mountain sides provides excellent food for cattle and goats, so that butter and cheese are made, as in Holland. Probably you have heard of Swiss and Dutch cheese.

Wood carving is also an important industry. During the long

winters the wood grown upon the mountains is carved into toys, clocks, and many other articles. Have you ever seen a Swiss clock?

Name the countries on each side of Switzerland, and notice that it is surrounded by people who speak German, French, and Italian. In consequence, instead of having one language of their own, the Swiss have these three, those living in each part speaking the language of the foreign country nearest to them.

The Swiss government has long been a republic, like our own, and BERNE is the capital. Find the chief cities, ZÜRICH and GENEVA.

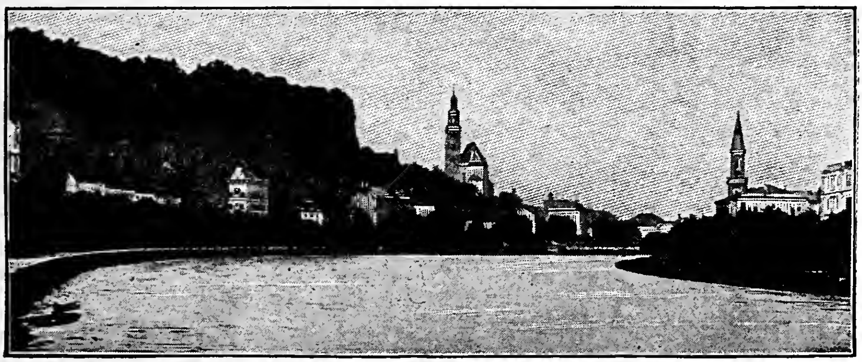


FIG. 200.

A view in Austria.

XI. Austria-Hungary. — Austria and Hungary are united under one monarchy, although they have different customs and languages. Many of the Austrians are closely related to the Germans; but the Hungarians are a very different race. The capital and largest city is VIENNA, the fourth in size in Europe. It is situated on the Danube River, so that it has water connection with many other places.

BUDAPEST is next to Vienna in importance. Like Minneapolis, it is in the midst of a great wheat region, and is a flour-milling centre.

The cultivation of flax leads to another manufacturing industry. What is it?

Which parts of Austria-Hungary are mountainous? Much coal and iron are found in the northwestern part near Germany, and PRAGUE is noted for the manufacture of hardware. The chief harbor is on the Adriatic coast; what is its name?

XII. Greece. — The country in Europe which has perhaps had the greatest influence upon the rest of the world is Greece. The Romans received many of their beliefs and

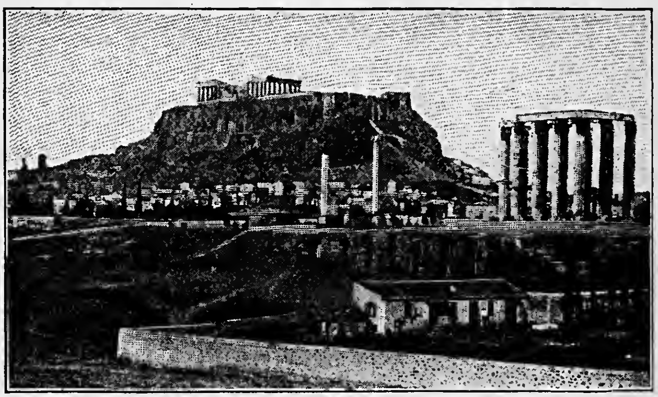


FIG. 201.

The Acropolis with its ruins on top, and the ruins of the Temple of Jupiter on the right, both in ancient Athens.

customs from the Greeks; and since many of ours come from the Romans, we also are greatly in debt to the Greeks.

The centre of this influence was ATHENS, once the most famous city in the world. Many years later, at the time of Christ, it was still an important place. Both Athens and Corinth, near by, are mentioned in the Bible.

The country is mountainous, producing raisins and other fruits, and much grass for grazing. But there is little mining and manufacturing.

At one time the Greeks were conquered by the Turks and very

cruelly treated by them; but they obtained their independence, and their government is now a monarchy with ATHENS for its capital.

XIII. Turkey. — The largest city in southeastern Europe is CONSTANTINOPLE, which has over one million inhabitants. Notice what an excellent location it has. It is the capital of Turkey, which, like Russia, is a country partly in Europe and partly in Asia.

FIG. 202.
A mosque, or Mohammedan church, in Constantinople.

The Turkish government is the worst in Europe. The ruler, called the *Sultan*, is an absolute despot, who governs his people so badly that they are kept extremely ignorant and poor. In all the other nations of Europe the Christian religion, either Catholic or Protestant, is followed; but the Turks are Mohammedans, followers of Mohammed, like many other people in Asia and Africa. They are religious fanatics, and dislike Christians very much.

One proof that the Turkish government is bad, is the fact that the people in many parts of the Empire have rebelled against it and fought for their freedom. For example, Roumania, east of Austria, used to belong to Turkey, but it is now an independent kingdom. The same is true of Bulgaria, Servia, and Montenegro; Greece has already been mentioned.

The people in all these countries are largely engaged in farming and herding, the Danube Valley being especially fertile. Grain, wine, and raisins are important products.

REVIEW QUESTIONS AND SUGGESTIONS

I. The British Isles. QUESTIONS. — (1) What are the divisions of the British Isles? Where is each? (2) Why have not the British Isles a colder climate? (3) Tell about the agriculture. (4) What kinds of cloth are manufactured? Where? (5) Where is the iron manufacturing carried on? (6) Of what value are the coal-beds? (7) Tell about Ireland. (8) Explain how Great Britain has come to have so many ships. (9) So many colonies. Name some of them, including several islands near North America. (10) What is the British Empire? What kind of government has it? (11) Locate all the cities mentioned.

SUGGESTIONS. — (12) What books have you read whose authors lived in Great Britain? (13) Examine pocket-knives and table-knives to see if you can find some made in England. (14) The iron manufactories of England remind you of what states in this country? (15) When did our country cease to be a colony of Great Britain? (16) What are the people from the four divisions of the British Isles called? (17) Make a drawing of the British Isles.

II. Norse Countries. QUESTIONS. — (18) What about the climate of Norway and Sweden? (19) Tell about the agriculture; the other industries. (20) What are the Norse nations? (21) What colonies have the Danes? (22) Name the chief industries of Denmark. (23) What kind of government have these Norse countries? and what is the capital of each?

SUGGESTIONS. — (24) Find out something about Iceland. (25) In what other section that you have studied is fishing important? (26) Find out about the length of days and nights in Norway. (27) Draw a map of the Scandinavian peninsula.

III. Russia. QUESTIONS. — (28) Tell about the size of Russia. (29) What parts of Russia in Europe are not fitted for farming? Why? (30) What is the main occupation of the people? Name the important products. (31) What are the tundras? The steppes? (32) Which is the largest river in Europe? (33) Where are the leading Russian ports? (34) Locate three of the largest cities, and state why each is important. (35) Tell about the government.

SUGGESTIONS. — (36) Why would you not expect Russian sailors to be as numerous as the English sailors? (37) Name some city of

the United States which is about as far north as Odessa. (38) How does the northern location of St. Petersburg interfere with its commerce by sea? (39) What city on the St. Lawrence has the same difficulty? (40) Show the route a vessel would take in going from Odessa to London. From Odessa to St. Petersburg.

IV. Germany. QUESTIONS. — (41) Where is the highest land in Germany? The great plains? (42) Tell about the chief farm products. (43) What are the principal manufactures in Germany? (44) Where is Hamburg? (45) For what is Berlin noted? Leipzig? Munich? Dresden? Locate each. (46) Tell about the government.

SUGGESTIONS. — (47) Do you know any songs or stories about the Rhine River? (48) Make a drawing showing the course of this river. (49) Do you know of any German paintings? Of any music written by Germans? (50) Make a collection of German pictures.

V. Holland. QUESTIONS. — (51) Tell about the dikes and canals of Holland. (52) What is the principal industry? Why? (53) What important colonies has Holland? (54) What are the main cities?

SUGGESTIONS. — (55) Write a story telling what you think might result if a dike were to give way. (56) Find a picture of a Dutch windmill. (57) Tell what you would expect to see in crossing Holland on a railway train.

VI. Belgium. QUESTIONS. — (58) What are the farm products of Belgium? (59) Tell what you can about flax. (60) Name and locate the two principal cities. (61) What about coal and iron?

SUGGESTIONS. — (62) Examine a piece of Brussels carpet; a piece of lace also.

VII. France. QUESTIONS. — (63) Describe the chief slopes of France. (64) What are the products in the northern part? In the southern part? (65) Tell about the silk industry. (66) What can you say about the capital? (67) About each of the other cities? (68) What kind of government has France?

SUGGESTIONS. — (69) Examine a cocoon and a piece of silk. Obtain a caterpillar, if possible the silkworm, and raise it in the school to see how the silkworm forms silk and what happens to the "worm." (70) Why would the value of a cocoon be destroyed if the chrysalis inside were to break through in order to get out? (71) Can you find any pictures of Paris?

VIII. Spain and Portugal. QUESTIONS. — (72) Where are the Pyrenees Mountains? (73) Tell about the former power of these countries. (74) Describe the relief and climate. (75) What are the industries on the plateau? (76) What minerals are found there? (77) Where is most of the farming? What are the chief products? (78) Name and locate the most important coast cities. The two capitals.

SUGGESTIONS. — (79) Would you expect the rivers to be navigable for any considerable distance from the Spanish coast? Why? (80) Make a sand map of Spain, showing the high and low land. (81) Examine some quicksilver. For what is it used? (82) Can you find out anything about the Moors and the Alhambra in southern Spain? Perhaps you can find pictures from there. Washington Irving has written some beautiful stories about the Alhambra.

IX. Italy. QUESTIONS. — (83) Where is Rome? Venice? Naples? Mt. Vesuvius? Milan? (84) Tell something about each of these. (85) Where are the mountains? (86) Where is the Po Valley? (87) What is raised in Italy?

SUGGESTIONS. — (88) Find pictures of some of the ruins in Rome. (89) Of some of the buildings in Venice. (90) Look on a globe to see in which direction Rome is from New York. (91) Draw a map of Italy.

X. Switzerland. QUESTIONS. — (92) What are some of the industries of the Swiss? (93) What languages are spoken? (94) Name the principal cities. (95) What is the kind of government?

SUGGESTIONS. — (96) Read the story of William Tell. (97) Find other stories about Switzerland. (98) What disadvantages do you see in having so many languages? (99) What large rivers rise in Switzerland? (100) Write a story describing a visit to the Alps. You will get some suggestions from Figure 15, page 18, Figure 110, page 132, and Figure 20, page 23.

XI. Austria-Hungary. QUESTIONS. — (101) Name four leading cities in Austria-Hungary. (102) Tell why each is important.

SUGGESTIONS. — (103) Trace the Danube River from its source to its mouth. (104) How far is Trieste from Venice? (105) Through what waters would a vessel pass in sailing from New York to Trieste? (106) By using the scale on the map, find out how far Vienna is from Munich. From Leipzig. From Berlin. From Paris. From St. Petersburg. (107) In what direction is it from each of these?

XII. Greece. QUESTIONS. — (108) What can you say about the influence of Greece upon the world? (109) Find Athens. (110) Tell about the climate and products.

SUGGESTIONS. — (111) Where can you read about Ulysses? (112) Have some one tell you the story of the Trojan War. (113) Find some other stories about the ancient Greeks.

XIII. Turkey. QUESTIONS. — (114) Where is Turkey? What is its capital? (115) Tell about its government. (116) What is the chief occupation of the people? (117) What countries have gained their independence from Turkey?

SUGGESTIONS. — (118) What is the boundary line between Turkey in Europe and Turkey in Asia? (119) Examine a Turkish rug. (120) What reasons can you give why Russia would like to own Constantinople?

GENERAL SUGGESTIONS

(121) Do you know of any persons who have come from one of these countries of Europe? If so, ask them to tell you about them. Also have them speak in their native language. (122) Ask a merchant to show you some goods from Europe. (123) What difficulties would you expect to meet if you were to travel through Europe without knowing any foreign languages? (124) Bound each of the countries of Europe. (125) Draw an outline map of Europe, putting in these boundaries and the principal rivers. (126) Make a dot to represent Berlin; also locate the other large cities. Mark the capitals with stars. (127) Collect pictures of Europe for the school collection. (128) Cut out scraps, from the magazines and papers, relating to the people, animals, plants, cities, etc., of different parts of Europe and present them to the school to be kept for use in the geography class. They can be arranged by countries and will be very useful.

For REFERENCES, see page 261.

XIX. ASIA

Map Questions. — (1) Through what zones does Asia extend? (2) What climate would you expect to find? (3) Where are the highest mountains and plateaus? (4) What rivers have their sources in that region? (5) What large inland seas do you find? (6) What three large peninsulas on the southern side? (7) What three were found on the south side of Europe? (8) How does Asia compare in size with Europe? (9) Find Asia on a globe. (10) How could you reach it, if you wished to go there? (11) On the map, which way is north from the British Isles? From Kamchatka?

Physical Geography. — Like Europe, the coast of Asia is very irregular, with many peninsulas and islands. Draw an outline map of it, showing these, with the larger bays and seas enclosed by them.

Note the direction in which the many mountain ranges extend. The loftiest among them, and in fact the highest in the world, are the Himalaya Mountains (Fig. 204), the highest peak, Mount Everest, being over twenty-nine thousand feet, or about five and one-half miles, above the sea. Where is it? How does it compare in height with Mt. Blanc? (See p. 270.)

North of the Himalayas are lofty plateaus, one of them, the plateau of Tibet, being about three miles in height. How does that compare with the Spanish plateau (see p. 271) and with our western plateau (see p. 271)? It is so high that the winter climate is very cold; and since the winds from the ocean have lost their moisture in passing over the mountains, these plateaus are also

ASIA
Scale of Miles
0
500
1000
Comparative Area
PENN.
45,215 Square Miles
Capitals of Countries
Other Places
L.L. POATES ENGR'G CO. N.Y.
30°
40°
50° Longitude
60°
East
70°
from
80° Greenwich
90°
100°
110°
120°
130°
ARCTIC OCEAN
North Cape
NOVA ZEMBLA
C. Chelyuskin
NEW SIBERIA ISLANDS
BRITISH ISLES
London
North Sea
Paris
Berlin
Vienna
Rome
EUROPE
St. Petersburg
Moscow
RUSSIA
Ural Mts.
Ural R.
Volga R.
Ob R.
Yenisei R.
Tundras
ARCTIC CIRCLE
Lena R.
Yakutsk
SIBERIA
RUSSIAN EMPIRE
Tobolsk
Irtish R.
Altai Mts.
Irkutsk
Lake Baikal
Yablonoi
Kaidalov
Stanovoi Mts.
Amur R.
Okhotsk Sea
SAKHALIN ISLAND
KAMCHATKA
Bering Sea
ALEUTIAN IS. (T. U.S.)
KURILE ISLANDS
YEZO
NIPPON
Tokyo
Yokohama
Kioto
Osaka
Japan Sea
EMPIRE OF JAPAN
MANCHURIA
Vladivostok
Harbin
Mukden
KOREA
Seoul
Port Arthur
Yellow Sea
Mediterranean Sea
CRETE
CYPRUS
TURKISH EMPIRE
Black Sea
Constantinople
Trebizond
Smyrna
Sea of Azov
Caucasus Mts.
TRANS CAUCASIA
Tiflis
Mt. Ararat
Caspian Sea
Tabriz
Elburz Mts.
Teheran
PERSIA
Persian Gulf
Tigris R.
Euphrates R.
Bagdad
Damascus
Jerusalem
Dead Sea
Alexandria
Cairo
SUEZ CANAL
ISTHMUS OF SUEZ
Suez
Nile R.
TROPIC OF CANCER
AFRICA
Red Sea
Mt. Sinai
Mecca
ARABIA
OMAN
Maskat
Mocha
Aden
Str. of Bab-el-Mandeb
Gulf of Aden
C. Guardaful
Arabian Sea
INDIAN OCEAN
Kirghiz Steppes
CENTRAL ASIA
Aral Sea
Syr R.
Lake Balkash
RUSSIAN TURKESTAN
Khiva
Samarkand
Bokhara
BOKHARA
Tashkend
Yarkand
PAMIR
Hindu Kush Mts.
Kabul
AFGHANISTAN
Khelat
BALUCHISTAN
Indus R.
SUNGARIA
MONGOLIA
Desert of Gobi
Khin-Gan Mts.
Jehol
Peking
GREAT WALL
CHINESE TURKESTAN
Kuenlun Mts.
CHINESE EMPIRE
TIBET
Cashmere
Lahore
Himalaya Mts.
Mt. Everest
Lassa
NEPAL
BHUTAN
Delhi
Lucknow
Benares
Ganges R.
Brahmaputra
Calcutta
INDIA
HINDUSTAN
Bombay
Hyderabad
Madras
C. Comorin
Colombo
CEYLON
Bay of Bengal
UPPER BURMA
Mandalay
LOWER BURMA
Salwin R.
Irawadi R.
Tientsin
Taiyuan
Hoang-ho
GRAND CANAL
Shanghai
Hangchau
Ningpo
Singanfu
Lanchau
Yanchau
Nanking
Suchau
Hankau
Wuchang
Chengtu
Yang-tse-Kiang
Changsha
Chungking
Suchau
Siangtan
CHINA
Changchau
Fuchau
Canton
Hongkong
Fuchan
Eastern Sea
LIUKIU IS.
Taiwan
FORMOSA
PACIFIC OCEAN
HAINAN
Hanoi
Hue
FRENCH INDO-CHINA
Mekong R.
SIAM
Bangkok
Gulf of Siam
Saigon
C. Cambodia
China Sea
LUZON
Manila
PHILIPPINE ISLANDS
(To United States)
MINDANAO
BORNEO
CELEBES
EQUATOR
STRAITS SETTLEMENTS
MALAY PEN.
Str. of Malakka
SUMATRA
Singapore

dry. Farther north it is drier still, and we find there the great desert of Gobi.

These mountains and plateaus form the watershed of the continent. Find three great rivers that flow northward from the watershed through the vast plain of Siberia. Name three that flow eastward into the Pacific Ocean. What others flow southward?

The southwestern portion of Asia is mainly a desert because the winds blowing over it come from the land instead of from the sea, and therefore have little vapor.

Fig. 204.

The snowy range of the lofty Himalayas.

From what has been said about the climate it is plain that the inhabitants of this continent must be found chiefly in the eastern and southern parts. There they live in vast numbers along the coast and the large rivers; in fact, nearly one-half of all the people in the world are found in these regions.

I. Southwestern Asia. — Rome and Athens have been mentioned as cities that have had a great influence upon other countries. But the part of the world which has probably had the greatest influence of all is that at the eastern end of the Mediterranean Sea. Here is the land

that used to be called Palestine, the home of the Jews; and here is still the city of JERUSALEM (Fig. 205), near which Christ was born about 1900 years ago, and in which He was crucified. The Christian churches and Christmas are in His memory. The home of Christ, where the Christian religion was founded, is now a part of the Turkish empire which extends into Asia.

Turkey extends down the western coast of the Arabian peninsula, and includes another famous city called MECCA. The Turks are not Christians but Mohammedans, or followers of Mohammed, who was

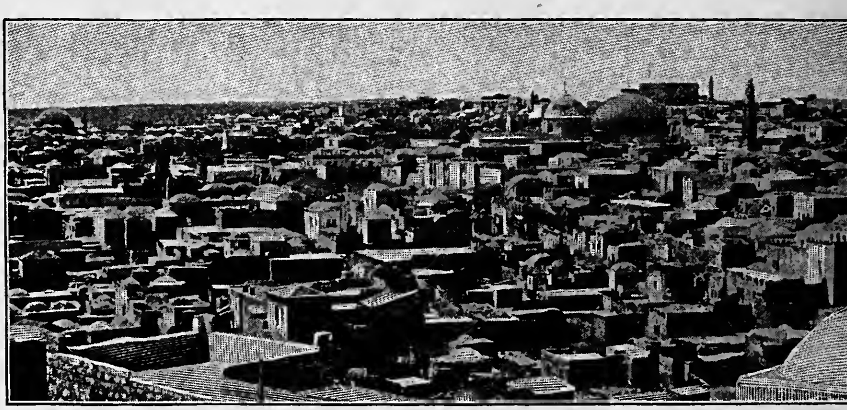


FIG. 205.

A picture of a part of Jerusalem.

born at Mecca nearly fourteen hundred years ago. The Mohammedans believe in God, and their holy book is called the Koran. A great many other people in Asia and northern Africa are followers of Mohammed.

The western part of Asia, including Turkey, Arabia, and Persia, has a very dry or arid climate. This is particularly true of Arabia, which is mainly a desert plateau much more arid than Spain.

In this desert country agriculture is not a very impor-

tant industry; but dates and coffee are raised there, especially near the rivers and along the coast. You have perhaps heard of MOCHA coffee, and if you look on the map you can find the place from which it gets its name.

FIG. 206.
The home of a group of Persian nomads.

Although so much of this region is desert, there are places, called *oases*, where water is found. As these are usually too small to furnish water and grass for large herds during a long time, the Arabs are forced to wander from place to place, having no fixed homes. On that account they are called *nomads* or wanderers (Fig. 206). They take special pride in raising horses, which have become famous throughout the world. They also keep cattle, sheep, goats, and camels.

Much of Persia is also a desert; but some parts are well suited to grazing, and the climate is warm enough for such fruits as figs and dates. What is the capital? The ruler of the Persians is a despot called the *Shah*.

The people of these countries are not civilized enough to carry on much manufacturing, although beautiful carpets, rugs, and shawls are made in great numbers, especially in Persia and Turkey. The

work is done by hand, and though it is well done, it requires a great deal of time, while in our great factories carpets are quickly made by machinery. Railways are almost unknown, and even carriage roads are usually lacking. Goods are carried upon camels in groups, called *caravans*, and men travel upon the backs of horses and camels.

II. Siberia. — Siberia belongs to Russia. It is a region of extensive plains and is much larger than the whole of Russia in Europe. Like northern Canada, much of it is so cold that few people can live there, and it has been made a prison for many Russians who have committed crime, or who have offended their despotic rulers.

A large portion of southwestern Siberia is a desert having numerous lakes without outlets. Would you expect them to be salt or fresh? Between this arid section and the bleak northern plains, or tundras, which resemble those of northern Europe, is a region where there are extensive forests, and broad plains suited for grazing and farming.

FIG. 207.
A Siberian three-horse wagon.

One of the chief sources of wealth of Siberia is in the gold mines of the Ural Mountains. Graphite, from which the "lead" in lead pencils is made, is also found there. Many of the prisoners from Russia are compelled to work in these mines.

The Russian government has built a great railway all the way from St. Petersburg eastward to Vladivostok on the Pacific coast. How far is that?

III. The Chinese Empire and Corea. — Some of the most important arts that we have ever learned first came from the Chinese. For instance, they made porcelain dishes long before Europeans knew how, and on that account

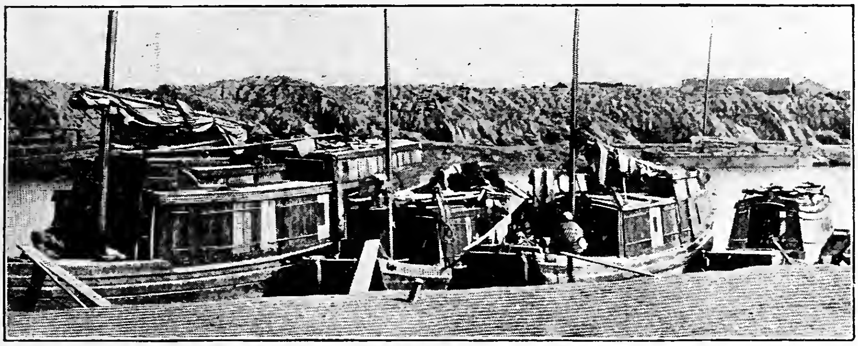


Fig. 208.
Houseboats on the Tientsin River of China.

those dishes are still called *chinaware*, even though manufactured in the United States. They invented gunpowder, and our firecrackers for the Fourth of July used to come from China. They also discovered how to make silk and paper, and they invented the art of printing.

But while this strange-looking, yellow race was once among the foremost nations of the earth, it is now very much behind. This is explained partly by the fact that their religion causes them to worship their ancestors, so that whatever their fathers did, they must do. Since their fathers had no railways, telegraphs, or telephones, none are wanted now. Owing to their fear of new things, they have neither travelled abroad much nor allowed foreigners to visit them.

But recently many Chinese have come to this country, working as servants, especially on the Pacific coast, and as laundrymen in all

parts of our country. Besides that, they now allow foreigners to live in some of their coast cities and trade with the people.

CANTON in the southern part, which is considerably larger than Chicago, and SHANGHAI, a city nearly as large as Baltimore, are the principal ports for trade with Americans. HONGKONG is a British port.

Much of the northern and western portions of the Chinese Empire are so high and dry that few persons can live there. Find the names of those parts. But the lower plains near the coast, especially the fertile flood plains and deltas of the great rivers, support a vast population, because the soil is fertile, and abundant rainfall is supplied by the damp winds from the Pacific. Here live nearly one-fourth of all the inhabitants of the globe, crowded together so closely that many thousands dwell in boats on the rivers.

In the northern part a great deal of wheat is raised; but farther south rice, millet, tea, and silk are important products. China produces more raw silk than any other country in the world. What other regions are noted for these same products?

FIG. 209.
Temple in Peking.

The government is an absolute monarchy, with the capital at PEKING, situated some distance in the interior, which, like TIENTSIN, its seaport, has about a million inhabitants.

Korea is also a very unprogressive nation which, until recently, would not permit foreigners to enter.

IV. Japan.—The Japanese live upon islands east of Asia, as the British do west of Europe. Their territory is but slightly larger than the British Isles, and there are not many more inhabitants. Many of the islands are small, but there are five large ones, the southernmost being Formosa. They are really the crest of a mountain range rising above the sea, and some of the mountain peaks are volcanoes.

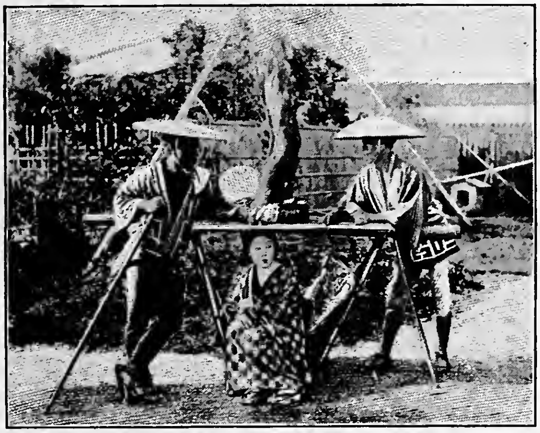


FIG. 210.
A Japanese woman being carried in a travelling chair by two Japanese men.

The Japanese used to be much like their neighbors, the Chinese; that is, they believed in ancestor worship, and wanted nothing to do with foreigners. But in 1853 an American naval officer, with several war-ships, entered the harbor of Yokohama and persuaded the Japanese to allow us to trade with them.

Before many years had passed the Japanese not only allowed foreigners to enter, but they invited them to come as teachers, and even sent some of their own young men abroad to study. There have been many Japanese students in the colleges and universities of the United States during the last twenty years.

The great war between Russia and Japan (1904–05) was fought for the control of Korea and proved that Japan had learned much from the western nations in the arts of war and peace. Japan is now

far in advance of all other parts of Asia. Railways, telephones, and newspapers are common, and there are many good schools, while rapid progress has been made in manufacturing.

That the Japanese are very skilful in many kinds of handiwork is suggested by the Japanese fans, parasols, napkins, dolls, and screens so often seen in this country. Whatever they make they try to make beautiful, being one of the most artistic races in the world.

FIG. 211.

The way Japanese babies are carried by the young girls. The baby leaning back is asleep.

Japan, like China, produces a great amount of silk, rice, and tea. There is also some mining.

The principal city and capital is TOKIO, one of the ten largest cities of the world, and is the home of the emperor, called the *Mikado*. Its seaport is YOKOHAMA, at the entrance of Tokio Bay.

V. India and Indo-China. — India, the central one of the three peninsulas on the southern side of Asia, is the country that Columbus thought he had reached when he discovered America. Hence the name "Indians" for the savages whom he met.

The damp winds from the Indian Ocean furnish the plains and mountains of India with so much rain that in places the forests form a perfect tangle or *jungle* of luxuriant vegetation, in which live tigers, elephants, and many other wild animals. Have you ever read Rudyard Kipling's "Jungle Book," which tells of this region?

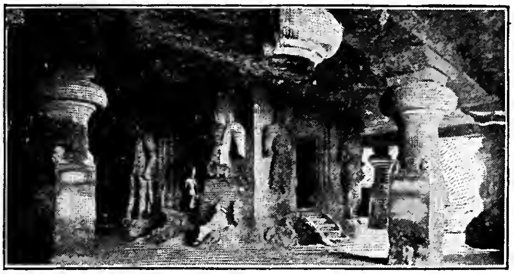


FIG. 212.
Idols in a cave near Bombay.

Several very large rivers rise in the Himalayas and flow across the plains. One is the Indus, from which the word India comes, and also the word Hindoos, as the inhabitants are sometimes called. The river flowing southeast is the Ganges, on which is the capital and largest city, CALCUTTA. The next city in size on this eastern coast is MADRAS, far to the south, while the largest city on the west side is BOMBAY, which has the best harbor of all.

FIG. 213.
A view in the palace grounds at Bangkok, Siam.

Nearly all this peninsula, together with the part of Indo-China called Burmah, belongs to England, through whose influence roads and railways have been built and manufacturing carried on.

One of the chief reasons why England holds India is for the important crops raised there. Cotton, one of the principal products,

is shipped to England to be made into cloth, and then some of this cloth is shipped back to India and sold. Where else have we found a similar situation?

Wheat is another great product, and since England cannot raise enough of that food for herself, she secures some of it from India. Other crops are poppies, from which opium is made, silk, rice, tea, coffee, and sugar.

The peninsula east of India, called Indo-China, and the East Indian Islands south of it, are other places that Columbus wished to reach. Here are found precious stones, pepper, such spices as nutmeg and cinnamon, and other valuable products, which were carried by caravans to Europe long before the time of Columbus. Many of these products are now shipped from SINGAPORE, an English city on an island at the southern end of the Malay peninsula. The greatest city in Indo-China is BANGKOK, the capital of the kingdom of Siam.

REVIEW QUESTIONS AND SUGGESTIONS

I. **Southwestern Asia.** QUESTIONS. — (1) What part of Asia has had the greatest influence upon the civilized world? Tell about it. (2) To what nation does Palestine belong? (3) What other parts of Asia belong to it? (4) Tell about Mecca. (5) Describe Arabia. (6) How do the Arabians live? (7) What do you know about Persia? (8) How do people travel in those countries?

SUGGESTIONS. — (9) What is meant by the date 1900? (10) What buildings in your neighborhood have been erected in the memory of Christ? (11) What stories in the Bible have you read that tell about places mentioned in this book or on the map? (12) What reasons can you suggest why the Turks have not taken possession of the interior of Arabia, as well as of the coast? (13) Does your grocer sell Mocha coffee? (14) Examine a Persian or Turkish rug. (15) Learn how camels are especially fitted to live in desert countries.

II. **Siberia.** QUESTIONS. — (16) Point toward Siberia. (17) Tell about the climate. (18) In what occupations are the people engaged? (19) How does Siberia compare in size with Russia?

Suggestions. — (20) What advantage will the railway be to Russia? (21) How does that railway compare in length with those reaching across the United States? (22) What object do you see in having the eastern terminus, Port Arthur, so far south?

III. Chinese Empire and Korea. Questions. — (23) Name some of the arts that we have learned from the Chinese. (24) What has made them so backward? (25) What special ports are open to American traders? (26) In what part of China do most of the people live? Why there? (27) What are the principal products? (28) What kind of a government has China? (29) Tell about Korea.

Suggestions. — (30) How can you distinguish a Chinaman from other men? (31) How does the number of people in China compare with the number in the whole of Europe? (See the table on p. 262.) (32) Write a story telling some of the differences between life in America and in China. (33) Draw the two chief rivers in China. (34) How might railways in China help to prevent the awful famines that they have there? (35) Find out about Confucius. About the Great Wall of China.

IV. Japan. Questions. — (36) Where is Japan? (37) In what way have the Japanese been like the Chinese? (38) How have they differed? (39) Why are they called an artistic race? (40) What are their chief products? (41) Name and locate the chief cities.

Suggestions. — (42) Make a collection of Japanese articles, as paper napkins, fans, etc. (43) Examine them to see in what respect they are artistic. (44) Collect pictures of Japanese houses and people.

V. India and Indo-China. Questions. — (45) What nation owns India? (46) What rivers in northern India? (47) Locate the chief cities. (48) What are the products? (49) What advantages does England enjoy in owning India? (50) Name the peninsula east of India. (51) What comes from there? (52) Find Singapore.

Suggestions. — (53) How far was Columbus from India when he discovered America? (54) What route should he have taken if he had continued his voyage to India? (55) What is the shortest route from Bombay to London? Through what waters would a vessel pass?

VI. Review. — (56) Draw an outline map of Asia and put in the boundary lines of the principal countries; also the rivers, mountains, and cities. (57) Find out about foreign missions to Asia.

For References, see page 261.

XX. AFRICA

Map Questions. — (1) What continent does Africa most resemble in shape? (2) In what parts are the chief mountain ranges? (3) Find the main slopes on the continent by a study of the rivers. (4) Name and trace the three largest rivers. (5) About how much of Africa lies in the torrid zone? (6) How does its coast line compare with that of Europe as to regularity? (7) What influence must that have upon the harbors?

The Dark Continent. — Although Africa is so near Europe that they almost join at the Strait of Gibraltar, and although it is one of the oldest continents that history tells about, it is the least known of them all.

There are several reasons for this. In the first place, south of the Mediterranean Sea is a broad desert, extending entirely across the continent. This, a part of which is called the Sahara Desert (Fig. 69), is about a thousand miles wide, and very difficult to cross.

Far south of this desert, for more than a thousand miles, the country is covered with a forest where the rainfall is heavy; and near the equator the vegetation is so rank that an almost impenetrable jungle is formed, like the Amazon jungle. It is inhabited by large and fierce animals, such as the elephant, tiger (Fig. 111), and lion.

The rivers offer further obstacles to travel. The continent is mainly a plateau, varying from one-fourth to one and one-half miles in height; and its rivers on approaching the ocean have numerous rapids and falls, so that boats cannot make their way up-stream.

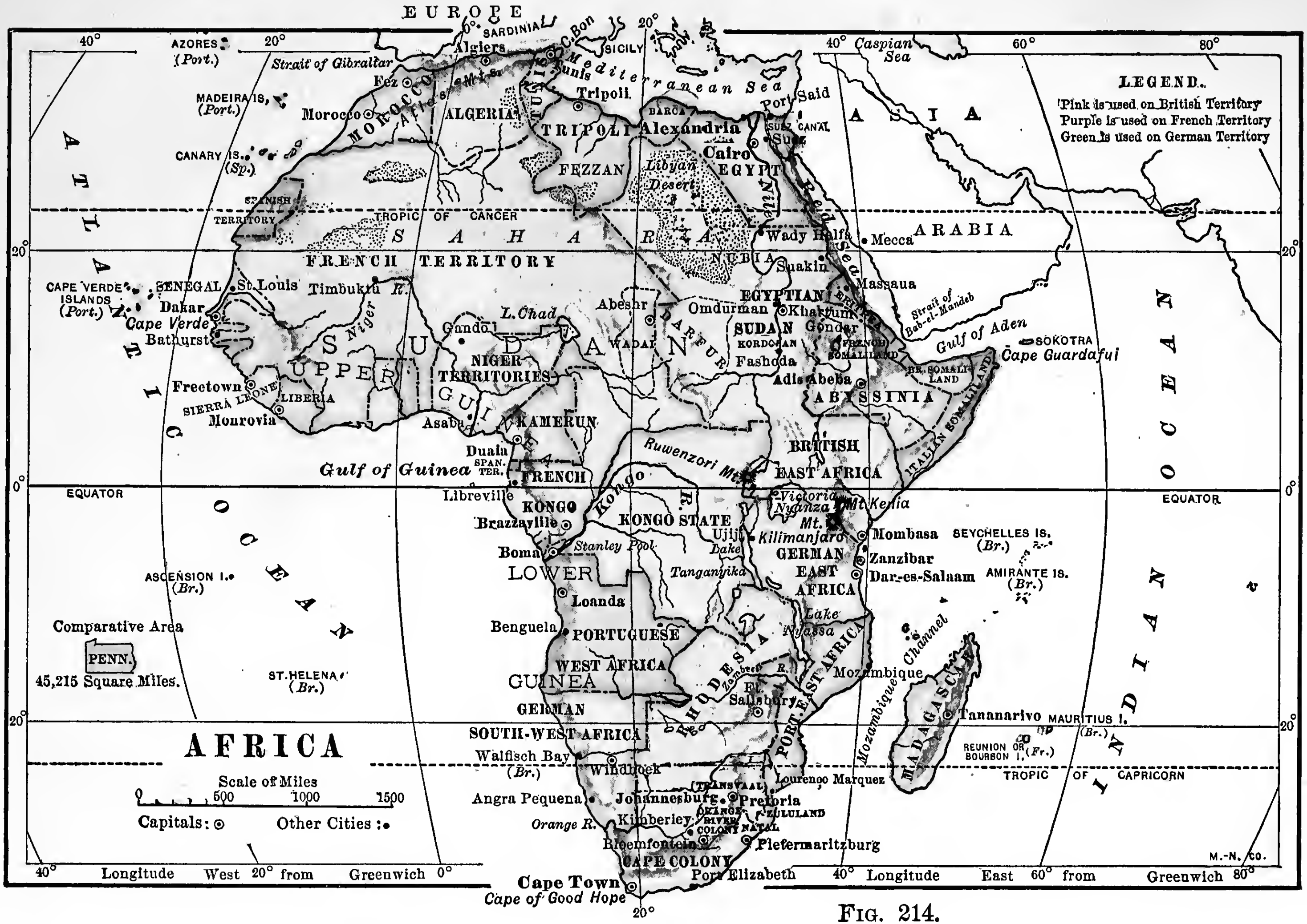

AFRICA
LEGEND.
Pink is used on British Territory
Purple is used on French Territory
Green is used on German Territory
EUROPE
ASIA
ARABIA
ATLANTIC OCEAN
INDIAN OCEAN
Mediterranean Sea
Red Sea
Caspian Sea
Gulf of Guinea
Gulf of Aden
Strait of Gibraltar
Strait of Bab-el-Mandeb
Mozambique Channel
TROPIC OF CANCER
TROPIC OF CAPRICORN
EQUATOR
SAHARA
FRENCH TERRITORY
UPPER GUINEA
LOWER GUINEA
SUDAN
MOROCCO
ALGERIA
TUNIS
TRIPOLI
FEZZAN
EGYPT
NUBIA
EGYPTIAN SUDAN
ABYSSINIA
BRITISH EAST AFRICA
GERMAN EAST AFRICA
KONGO STATE
FRENCH KONGO
KAMERUN
NIGER TERRITORIES
PORTUGUESE WEST AFRICA
GERMAN SOUTH-WEST AFRICA
RHODESIA
PORT. EAST AFRICA
CAPE COLONY
MADAGASCAR
Cape Town
Cape of Good Hope
Cairo
Alexandria
Algiers
Tunis
Tripoli
Morocco
Fez
Timbuktu
Khartum
Omdurman
Fashoda
Adis Abeba
Mombasa
Zanzibar
Dar-es-Salaam
Loanda
Benguela
Boma
Brazzaville
Libreville
Duala
Freetown
Monrovia
St. Louis
Dakar
Bathurst
Windhoek
Walfisch Bay (Br.)
Angra Pequena
Johannesburg
Pretoria
Kimberley
Bloemfontein
Pietermaritzburg
Port Elizabeth
Lourenço Marquez
Mozambique
Tananarivo
Mecca
Port Said
Suez
Suakin
Massaua
Wady Halfa
L. Chad
Lake Tanganyika
Lake Nyassa
Victoria Nyanza
Mt. Kilimanjaro
Mt. Kenia
Ruwenzori Mt.
Kongo R.
Niger R.
Nile
Zambezi R.
Orange R.
AZORES (Port.)
MADEIRA IS. (Port.)
CANARY IS. (Sp.)
CAPE VERDE ISLANDS (Port.)
ASCENSION I. (Br.)
ST. HELENA (Br.)
SEYCHELLES IS. (Br.)
AMIRANTE IS. (Br.)
MAURITIUS I. (Br.)
REUNION OR BOURBON I. (Fr.)
SOKOTRA
Cape Guardafui
Comparative Area
PENN.
45,215 Square Miles.
Scale of Miles
500 1000 1500
Capitals: ⊙ Other Cities: •
Longitude West 20° from Greenwich 0°
Longitude East 60° from Greenwich 80°
M.-N. CO.

FIG. 214.

FIG. 215.
The Great Pyramid and the Sphynx. What animals are those standing on the desert sands near the Sphynx?

Not only are there deserts, unnavigable rivers, and dense forests with fierce animals, but there are hordes of savages belonging to the black race. It was from Africa that *negroes* were first brought to our country as slaves, and on that account those now here are often called Africans.

Here, then, are several reasons why we know so little about Africa, which, because of this, and because so many blacks live there, is sometimes called the "dark continent."

Northern Africa. — The African side of the Mediterranean Sea, being so close to Asia and Europe, has long been settled by the white race. Many of the inhabitants

are Arabs, who, being believers in Mohammed, still make pilgrimages to Mecca in Arabia, like other followers of that prophet.

The best-known country in this section is Egypt, and CAIRO, its capital, is the largest city in Africa, having more than half a million people. ALEXANDRIA is the chief Egyptian port.

This is the country over which the Pharaohs, the kings of Egypt, used to rule; and the ruins of the immense pyramids and monuments that they built thousands of years ago may still be seen. Here, the Bible tells, Moses once lived; and Joseph also. What stories do you remember about them?

Most of Egypt is a desert country, like Arabia on the one side and the Sahara Desert on the other. The Nile River flows through this desert, and every year the heavy floods, from the mountains of Abyssinia and the forest country near the equator, cause it to rise higher and higher until it overflows its banks. These floods, spreading out over the flood plain and level delta of the Nile, irrigate the land.

As in other rivers, the water carries with it an abundance of mud, which settles in a thin layer of rich soil upon the flood plain, making it so fertile that excellent crops of cotton, sugar-cane, and grain can be raised after the water is gone. By this means millions of people obtain food, although they live in a desert region.

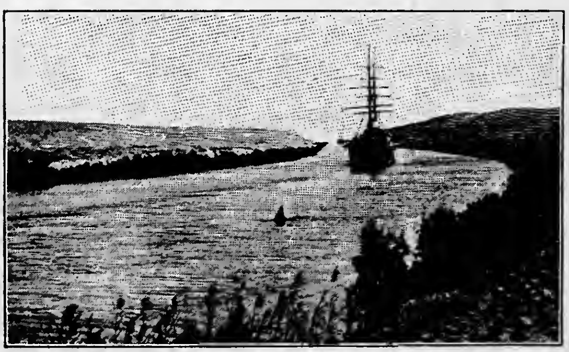


FIG. 216.
A ship passing through the Suez Canal.

The eastern part of Egypt includes the Isthmus of Suez, which connects Africa with Asia. Because of this narrow neck of land, ships sailing from Europe to Asia were compelled to go all the way round Africa; but in 1869 a canal one hundred miles long was completed across the isthmus, so that vessels can now make a short cut. Estimate how many miles are saved by the Suez Canal in going from London to Calcutta.

Name the countries west of Egypt along the Mediterranean coast. What are their capitals? Most of them, like Egypt itself, are controlled by countries of Europe. Their products are similar to those on the northern side of the Mediterranean. What are some of them?

FIG. 217.
A family camped on an oasis in the desert of Morocco.

On the desert of Sahara few people are able to live. Some parts are sandy plains, while others are rocky and hilly, and in places even mountainous. But here and there, as in Arabia, are oases where water comes from underground, so that grass and date palms are able to grow. Sometimes these oases are so large that villages are built upon them; and the caravans that cross the desert to bring ivory and other products from the south, make their stops at these places. Some of these caravans consist of hundreds of camels, so that there is need of much food and water.

Central Africa. — Until a few years ago this was a wilderness that no civilized man had ever visited; but now much of it has been explored. The natives are mainly savage blacks; and the Arabs, who go there to purchase ivory, still carry large numbers of them away as slaves.

The northern part is called the Sudan. Near the borders of the Sahara the country is a desert; but this condition gradually changes until, farther south, the land is covered with a dense tropical forest, for the rains are heavy near the equator. In this region live the lion, rhinoceros, giraffe, and elephant, the latter being killed for the sake of its ivory tusks. Some of the forest woods are valuable, and since the rubber tree flourishes there, as along the Amazon, rubber is another product. See page 202.

The two great rivers of this region are the Niger, north of the equator, and the Kongo, south of it. They are the main roads leading inland, although their falls and rapids greatly interfere with travel. Throughout that entire region there are almost no wagon roads, so that goods must be carried either on the rivers or over paths or trails in pack trains. But this situation is improving as the nations of Europe obtain more and more control. At the present time, several European countries claim parts of Africa, England having a very large share, as you will see from the map, and they are introducing civilized laws, railways, and other improvements.

Fig. 218.
Kaffirs, South African savages, in full dress.

South Africa. — Southern Africa is the best-developed section of the continent. It was originally settled by the

Dutch, though England has taken possession of a portion of it. Part of it is a high plateau, with a warm temperate

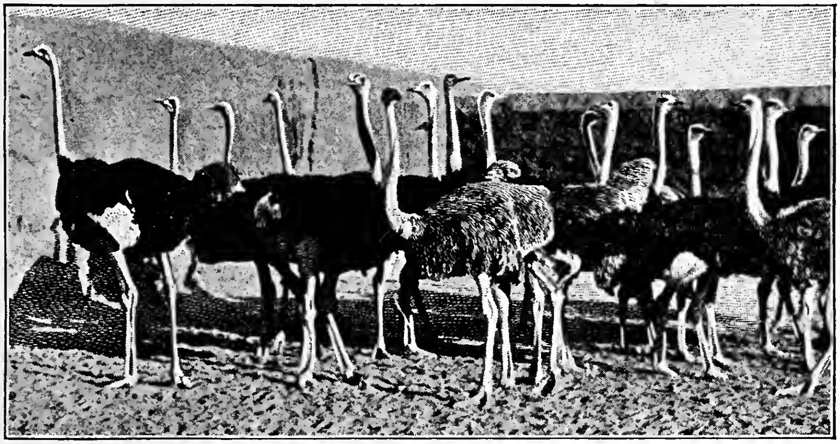


FIG. 219.
A group of ostriches in South Africa.

climate, having many of the same products as our own country. Most of the people are engaged in farming and ranching, producing grain, wool, and hides. Ostrich farming is an important industry in Cape Colony, the beautiful feathers of the male bird being very valuable.

FIG. 220.
A picture of a diamond mine at Kimberley.

JOHANNESBURG is the centre of the richest gold-mining region in the world, and more diamonds are obtained from near KIMBERLEY than from any other part of the globe. Portions of southern Africa have long been settled

by Europeans and much of it is now owned by England, the oldest colony being Cape Colony, the capital of which is CAPE TOWN. Consequently many railways and good wagon roads have been built, and many other advances have been made.

REVIEW QUESTIONS. — (1) Why is so little known about Africa? (2) Why is it called the "dark continent"? (3) Which is the best-known country in northern Africa? (4) Name and locate its two chief cities. (5) Tell about the Nile River. (6) About the Suez Canal. (7) About the Sahara Desert. (8) Where is the Sudan? What animals live there? (9) What two great rivers are in Central Africa? (10) How are goods carried from place to place? (11) What influence are the nations of Europe having upon Africa? (12) What climate has Southern Africa? What are the occupations of the people?

SUGGESTIONS. — (1) What reasons can you give why Timbuktu should be an important trade centre? (2) The caravans composed of camels travel at the rate of about sixteen miles per day. How long would it probably take for a caravan to travel from Timbuktu to Tripoli on the Mediterranean coast? (3) One camel can carry about four hundred pounds. How many tons could a caravan of six hundred camels carry? (4) What are some of the dangers of a journey across the desert? (5) Beginning with the western Sahara, trace the desert country that extends across Africa and Asia. (6) Why should the two largest cities in Africa be located at or near the mouth of the Nile River? (7) Find some object made of ivory and show it to the class. (8) Examine an ostrich feather and a diamond. (9) Why are there no tributaries to the northern half of the Nile? What part of the river, then, probably has most water? (10) Find out about the war between the Boers (those living in the South African Republic and Orange Free State) and the British. (11) Draw an outline map of Africa and put in the main rivers and cities.

For REFERENCES, see page 261.

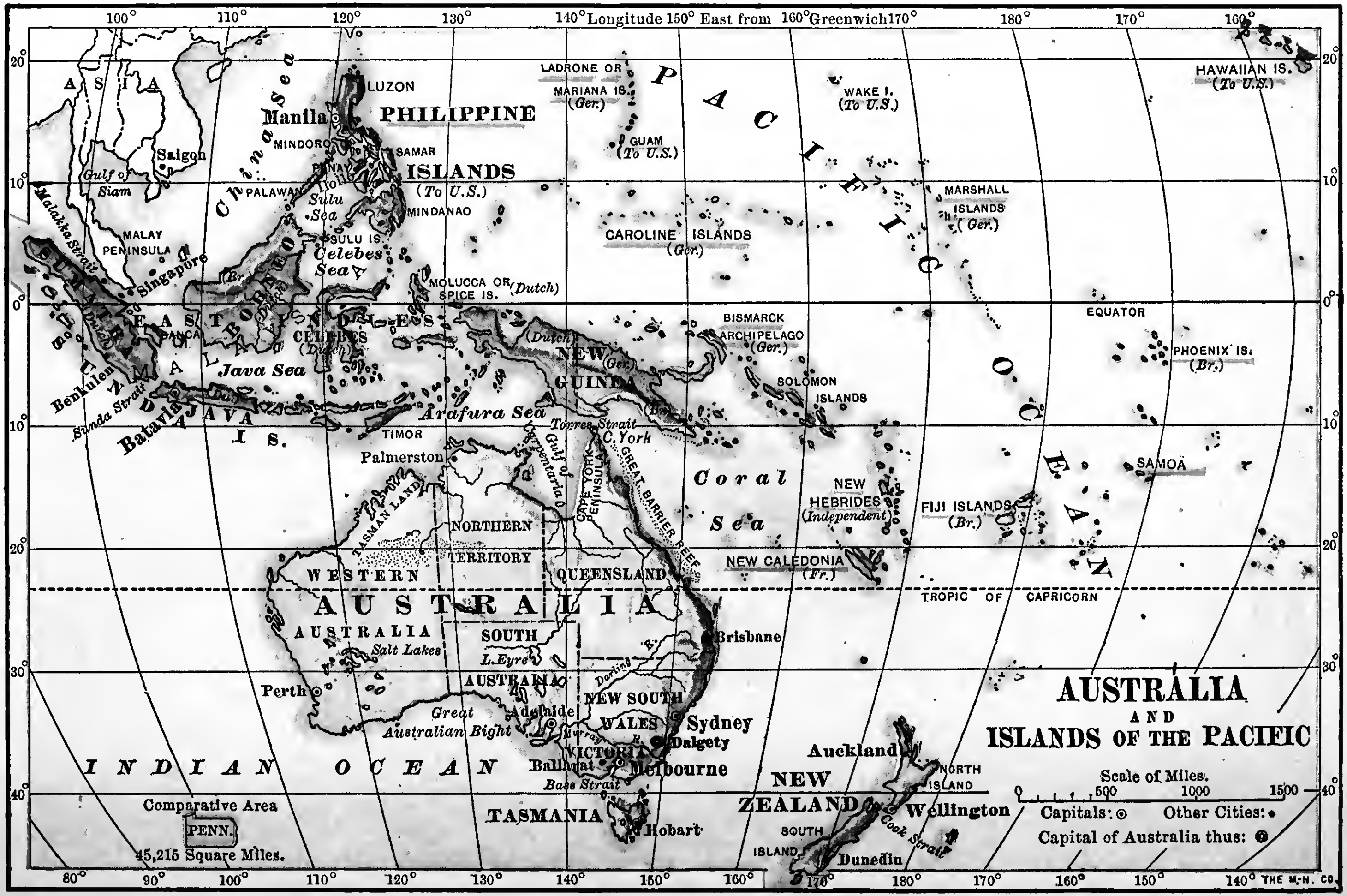

AUSTRALIA
AND
ISLANDS OF THE PACIFIC
Longitude 150° East from 160° Greenwich 170°
Scale of Miles.
Capitals: Other Cities:
Capital of Australia thus:
Comparative Area
PENN.
45,215 Square Miles.
PACIFIC OCEAN
INDIAN OCEAN
ASIA
PHILIPPINE ISLANDS (To U.S.)
LUZON
Manila
MINDORO
SAMAR
PALAWAN
MINDANAO
China Sea
Sulu Sea
SULU IS.
Celebes Sea
Saigon
Gulf of Siam
MALAY PENINSULA
Singapore
Malakka Strait
MOLUCCA OR SPICE IS. (Dutch)
EAST INDIES
BORNEO
CELEBES (Dutch)
Java Sea
JAVA
Batavia
Benkulen
Sunda Strait
TIMOR
Arafura Sea
NEW GUINEA
(Dutch)
(Ger.)
Torres Strait
C. York
Gulf of Carpentaria
CAPE YORK PENINSULA
GREAT BARRIER REEF
Palmerston
TASMAN LAND
NORTHERN TERRITORY
WESTERN AUSTRALIA
AUSTRALIA
Salt Lakes
Perth
QUEENSLAND
SOUTH AUSTRALIA
L. Eyre
Great Australian Bight
Adelaide
NEW SOUTH WALES
Darling
Murray
VICTORIA
Ballarat
Melbourne
Bass Strait
Sydney
Dalgety
Brisbane
TASMANIA
Hobart
Coral Sea
LADRONE OR MARIANA IS. (Ger.)
GUAM (To U.S.)
CAROLINE ISLANDS (Ger.)
WAKE I. (To U.S.)
MARSHALL ISLANDS (Ger.)
BISMARCK ARCHIPELAGO (Ger.)
SOLOMON ISLANDS
NEW HEBRIDES (Independent)
NEW CALEDONIA (Fr.)
FIJI ISLANDS (Br.)
SAMOA
PHOENIX IS. (Br.)
HAWAIIAN IS. (To U.S.)
EQUATOR
TROPIC OF CAPRICORN
NEW ZEALAND
NORTH ISLAND
SOUTH ISLAND
Auckland
Wellington
Cook Strait
Dunedin
THE M.-N. CO.

FIG. 221.

XXI. AUSTRALIA, THE EAST INDIES, PHILIPPINES, AND THE OTHER ISLANDS OF THE PACIFIC

MAP QUESTIONS. — (1) Find Australia on a globe and show how you would reach it from New York in a vessel. Through what waters would you pass? (See Fig. 120.) (2) From San Francisco? From London? (3) In what part are most of the mountains? (4) The rivers? (5) The cities? (6) In what zones is Australia? (7) Will there be any cold winter on this continent? (8) Look on a globe to see what other continents are in the same zones.

(9) What are the principal islands of the East Indies? Find Batavia. (10) In what direction are the Philippine Islands from Australia? (11) Estimate the distance. (12) Find the Hawaiian Islands.

I. Australia. — The names of the three eastern divisions of Australia — Victoria, New South Wales, and Queensland — suggest the country to which this continent belongs. Which is it? As has been done in Canada, the various sections of Australia have been joined into one confederation similar to our own confederation of states.

Australia is the smallest of the continents, being about the size of the United States, not including Alaska. It is a low plateau, with the chief mountain range on the eastern side. These mountains have much influence on the climate; for, since the prevailing winds are from the southeast, as they reach this range, and rise to pass over it, they grow cooler and lose most of their moisture. If the mountains were on the western side, as the Andes are

in South America, nearly the whole country might be well watered, like the Amazon Valley. As it is, however, the eastern coast of Australia has abundant rain, while farther westward it becomes drier, until, at a distance of one hundred and fifty miles from the coast, farming is almost impossible.

What about the country farther west? With what part of Africa should it be compared? Where must the chief

Fig. 222.
A forest of tree ferns in Australia.

rivers be? Where might we expect to find salt lakes? The best farm land? The principal cities and most of the people?

Now examine the map to see if you are right. Where is the large desert? (It is dotted.) What is the name of the main river? There is often so little rain, even on the lower part of the Murray River Basin, that the river grows smaller toward its mouth; and its chief tributary, the Darling, dries up almost entirely.

When the English began to colonize this country, they found it inhabited by a very low class of savages; and the plants and animals were found to be different from those elsewhere. A great part of the interior was covered with a low bush, called "scrub," having hard, prickly leaves and often growing so dense that it was difficult for one to make his way through it. It caused the country to look desolate indeed.

There were none of the fierce animals common to other countries, the largest being the kangaroo, which is furnished with a sack or pouch for carrying its young. Instead of running on all fours, it jumps along on its hind legs, using its tail for support.

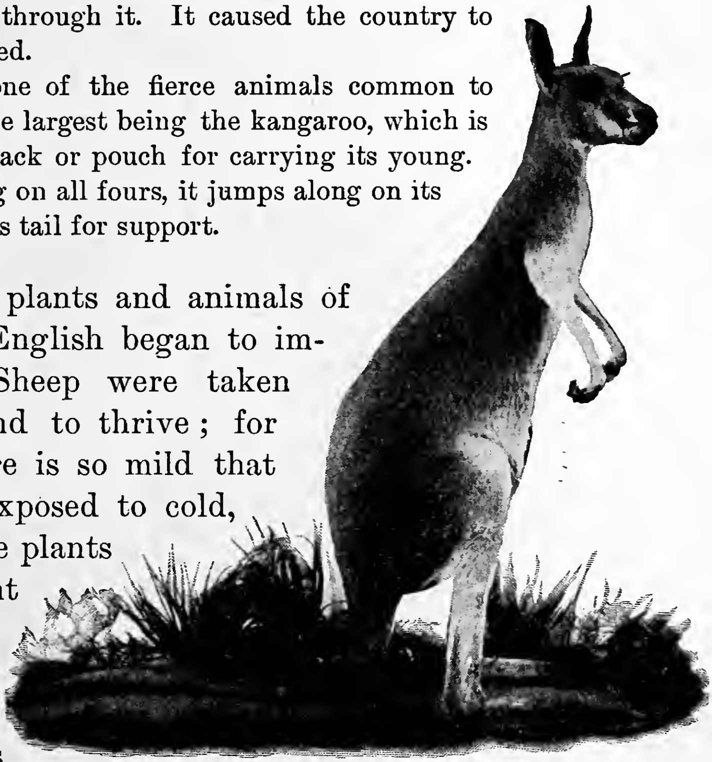


FIG. 223.
An Australian kangaroo.

Finding the plants and animals of little use, the English began to import some. Sheep were taken there and found to thrive; for the temperature is so mild that they are not exposed to cold, and some of the plants furnish excellent food. Consequently, great sheep ranches or *sheep runs*, as they are called there, have been established. The best sections for this purpose are Victoria and New South Wales, where wool has become one of the chief exports. Indeed, Australian wool is the best in the world.

The imported cattle have likewise multiplied, so that hides and meat are produced in abundance. Wheat and corn also flourish, and many fruits, such as we know, are now plentiful in that region.

The presence of mountains suggests that metals might exist there, which is the case. For many years Australia has ranked as one of the most important gold-producing countries of the world.

Since these industries have become very extensive, especially in the rainy southeastern part, we see why several great cities have grown up in that section. The largest is MELBOURNE, the capital of Victoria, which has about a half million people. The next is SYDNEY, the capital of New South Wales, nearly as large ; and the third is ADELAIDE, the capital of South Australia.

An island, Tasmania, just south of Australia, is owned by the British, and has almost the same industries as Victoria.

The New Zealand Islands are also British, and in the climate and the customs of the people they resemble Australia. What is the capital? What other city is found there? Do you remember the geysers for which the Yellowstone National Park is noted (p. 178)? New Zealand and Iceland are the only two other parts of the world where geysers are found.

Manufacturing is not yet greatly developed, so that quantities of wool, hides, metals, etc., are exported, going mainly to England, since these are colonies of Great Britain. Some of the imports that must be received in return you can probably name.

II. The East Indies. — Between Australia and Asia are a large number of islands, many of them too small to place upon the map. What are the names of some of the largest of this group, or archipelago, known as the East Indies? The one that you have probably heard about most often is Java, from which the Java coffee comes.

Among the forests of these islands are many different kinds of valuable tropical woods. Sugar, tobacco, pepper, spices, and precious stones are other valuable products.

These islands, like those of the Japanese Empire, are the crests of mountains in the sea. Among them are many very active volcanoes, some of them having caused terrible destruction by their frightful eruptions. The islands belong to European countries, and you will find the names of these countries marked on the map.

III. The Philippine Islands. — The principal city on the Philippine Islands is MANILA, on Luzon Island, where Admiral Dewey destroyed the Spanish fleet.

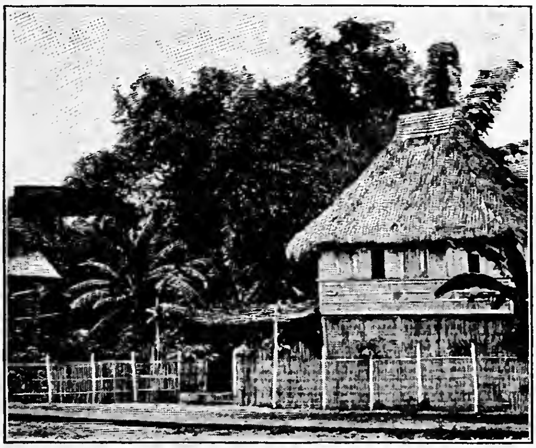


FIG. 224.
A native house in Manila. In order to be well above the damp ground, the people live in the upper part. Notice the bamboo fence.

Notice (Fig. 203) that they lie between the Japanese Islands and the East Indies, both of which were said to be mountain ranges in the sea. The Philippines are also mountains, forming a part of the same chain.

There are valuable kinds of wood in the forests, and many mineral deposits; but these were never much used by the Spaniards. The chief products have been sugar, tobacco, and hemp, which is used in making ropes. Now that the United States is in control of the islands, it is probable that their mineral and other resources will be developed.

On these islands dwell several different races. There are still many savages there, especially in the dense forests of the interior (Fig. 99). Some of them are called Negritos or little negroes. On the Sulu Islands are Mohammedans called Moros. The Tagalogs belong to the more advanced tribes, who have learned the arts of civilization from the Spaniards.

IV. Islands of the Pacific. — There are many hundreds of islands in the Pacific Ocean, some of them being tiny coral islands, others large and mountainous. They are all located where mountain ranges or volcanic peaks rise from the great plain of the ocean floor.

Find the Fiji Islands. They are also British. What other group of small islands do you see in that region? Find the Samoan Islands. One of these belongs to the United States. What large island is just north of Australia? In what zone does it lie? One part is British, one part Dutch, and one part German. All of its products are tropical, and it is covered with a dense forest and inhabited by fierce savages. Very few Europeans live there.

Among the islands of the Pacific we must not forget to mention the HAWAIIAN ISLANDS, for they now form a part of our own country. They are situated in the mid-Pacific on the way from San Francisco to Australia, and consist of a number of islands, the largest being Hawaii. All of them are volcanic, and on Hawaii are two of the largest volcanoes in the world (Fig. 101). Being in the torrid zone, their climate is warm enough for sugar raising, and this is one of the principal industries of the islands. Where else have we found this industry? HONOLULU is the capital and largest city.

REVIEW QUESTIONS AND SUGGESTIONS

I. Australia. QUESTIONS. — (1) To what country does Australia belong? (2) How does it compare in size with the United States? (3) How does the mountain range on the east affect the climate? (4) Which, then, is the most valuable part of the country? (5) Tell about the native plants and animals. (6) What animals and plants have been imported? (7) What industries have resulted? (8) Name the principal exports. (9) Locate the chief cities.

SUGGESTIONS. — (10) Sketch Australia, putting in the Murray River and the principal cities. (11) What other places in the world are noted for sheep and cattle raising? (12) For gold mining? (13) Read about the great trouble the imported rabbits have caused in Australia. (14) Where are the desert countries of the world? Make a sketch map to show them.

II. East Indies. QUESTIONS. — (15) Name several of the larger islands of the East Indies. (16) What are the products?

SUGGESTIONS. — (17) Why were they named the East Indies? (18) Find what spices are used in cooking at your home. (19) Make a collection of spices, trying to find where each kind came from. (20) See on the map (Fig. 221) to what European countries each of the larger islands belongs. (21) Find where the tea and coffee used at your home came from. By what route are they probably brought?

III. Philippine Islands. QUESTIONS. — (22) Where are the Philippine Islands? (23) Name the principal city. (24) What has recently made it famous? (25) What are the names of the largest islands? (26) How far is Manila from China? (27) What races occupy these islands?

SUGGESTIONS. — (28) Collect some Manila hemp rope. (29) Find out about the battle of Manila Bay and also about the war with the Filipinos. (30) Collect pictures from the Philippines.

IV. Islands of the Pacific. QUESTIONS. — (31) Find Tasmania; New Zealand; the Fiji Islands. (32) What large island lies north of Australia? Tell about it. (33) Tell about the Hawaiian Islands.

SUGGESTIONS. — (34) Find out something about the Fiji Islands. (35) About the Hawaiian Islands. (36) Find out some events that have happened on the Samoan Islands.

For REFERENCES, see page 261.

BOOKS OF REFERENCE[1]

McM. means The Macmillan Co., New York; Ginn, Ginn & Co., Boston, Mass.; A. B. C., American Book Co., New York; S. B. C., Silver, Burdett & Co., New York; Heath, D. C. Heath & Co., Boston, Mass.; E. P. C., Educational Publishing Co., Boston, Mass.; Scribner, C. Scribner & Sons, New York.

METHODS, AIDS, ETC.

Geikie, "The Teaching of Geography" (McM., $0.60); King, "Methods and Aids in Geography" (Lee & Shepard, Boston, $1.20); Parker, "How to Study Geography" (D. Appleton & Co., New York, $1.50); Nichols, "Topics in Geography" (Heath, $0.65); Trotter, "Lessons in the New Geography" (Heath, $1.00); McMurry, "Special Method in Geography" (Public School Publishing Co., Bloomington, Ill., $0.50); McCormick, "Suggestions on Teaching Geography" (same publisher, $0.50); McMurry, "A Course of Study in Geography" (Herbartian Society, University of Chicago); Frye, "The Child and Nature" (Ginn, $0.80); Frye, "Teacher's Manual of Methods in Geography" (Ginn, $0.50); Redway, "Manual of Geography" (Heath, $0.65); Morton, "Lessons on the Continents" (A. S. Barnes & Co., New York, $0.20; McCormick, "Practical Work in Geography" (A. Flanagan, Chicago, Ill., $0.80).

Journal of School Geography (R. E. Dodge, Teachers' College, Columbia University, New York City, $1.00 per year); *National*

[1] These references are not intended to be exhaustive, but, rather, suggestive. Most, if not all, are to first-class sources. The attempt has been to make few references, assuming that the teacher will have others in mind. While there may seem to be many here, a careful examination will reveal the fact that really few books are referred to. Some of those mentioned at the end of Part I will be found useful for Part II also.

Geographic Magazine (Washington, D. C., $2.00; includes membership to Society); Bulletin, *American Bureau of Geography* (Winona, Minn., $1.00; includes membership to Bureau); "The Statesman's Year Book," published each year, gives latest statistics, etc. (McM., $3.00); Mill, "Hints to Teachers and Students on the Choice of Geographical Books" (Longmans, Green & Co., New York, $1.25); Ritter, "Comparative Geography" (A. B. C., $1.00); Shaler, "Nature and Man in America" (Scribner, $1.50); Guyot, "Earth and Man" (Scribner, $1.75); Champlin, "Cyclopedia of Common Things" (H. Holt & Co., New York, $2.50); Champlin, "Cyclopedia of Persons and Places" (same publisher, $2.50); Murché, "Science Readers" (McM., I and II, $0.25 each, III and IV, $0.40 each, V and VI, $0.50 each); Lange, "Handbook of Nature Study" (McM., $1.00); Yonge, "Little Lucy's Wonderful Globe" (McM., $0.50); Strong, "All the Year Round" (Ginn, three volumes, $0.30 each); Carpenter, "Geographical Readers" (A. B. C., Vol. II, Asia, $0.60; volume on North America, $0.60); Guyot, "Geographical Reader" (A. B. C., $0.60); Gonner, "Commercial Geography" (McM., $0.75); Tilden, "Grammar School (Commercial) Geography" (T. R. Shewell & Co., Boston, $1.25); Chisholm, "Commercial Geography" (Longmans, Green & Co., New York, $1.00); Mill, "General Geography" (McM., $0.90); Lyde, "Man and His Markets" (McM., $0.50); Herbertson, "Man and His Work" (McM., $0.60); Pratt, "American History Stories" (E. P. C., four volumes, $0.36 each); Pratt, "Stories of Colonial Children" (E. P. C., $0.40); Shaler, "First Book in Geology" (Heath, $0.60); Davis, "Physical Geography" (Ginn, $1.25); Tarr, "Elementary Geology" (McM., $1.40); Tarr, "Elementary Physical Geography" (McM., $1.40); Tarr, "First Book of Physical Geography" (McM., $1.10). Excellent selections may also be found in many school readers.

Section I. Form and Size of the Earth.—Andrews, "Seven Little Sisters," section on "The Ball Itself" (Ginn, $0.50); Irving, "Life and Voyages of Christopher Columbus" (G. P. Putnam's Sons, New York, $1.75); for Columbus, Magellan, etc., see various school histories. Also, poem on "Columbus" by Tennyson D'Anvers, "Science Ladders," Vol. I (E. P. C., $0.40); Gee, "Short Studies in Nature Knowledge," section on "The Great Globe Itself" (McM., $1.10); Ritter, Comparative Geography," First Part (A. B. C., $1.00).

Section II. Daily Motion of the Earth and its Results. — Redway, "Manual of Geography," Chapter VI (Heath, $0.65); "Daybreak" (poem), Longfellow.

Section III. The Zones. — Eggleston, "Stories of American Life and Adventure," section on "Adventures in Alaska" (A. B. C., $0.50); Andrews, "Seven Little Sisters," sections on "The Little Brown Baby," "Agoonack, the Esquimau Sister," and "How Agoonack Lives" (Ginn, $0.50); Schwatka, "The Children of the Cold" (E. P. C., $1.25); Ballou, "Footprints of Travel," Chapters XXIX and XXX (Ginn, $1.00); King, "The Picturesque Geographical Readers," First Book, Part 2 (Lee & Shepard, Boston, $0.50).

Section IV. Heat within the Earth and its Results. — Tarr, "First Book of Physical Geography," Chapters I (p. 8), XIX, and XX (McM., $1.10); Trotter, "Lessons in the New Geography," pp. 16–17 (Heath, $1.00); Redway, "Manual of Geography," Chapter VII (Heath, $0.65); Kingsley, "Madam How and Lady Why," section on "Volcanoes" (McM., $0.50); Gee, "Short Studies in Nature Knowledge," Chapter XI (McM., $1.10); Kelly, "Leaves from Nature's Story Book," Vol. III, "The Records of the Rocks" (E. P. C., $0.40).

Section V. The Continents and Oceans. — Andrews, "Seven Little Sisters" (Ginn, $0.50); Ballou, "Footprints of Travel" (Ginn, $1.00); Gee, "Short Studies in Nature Knowledge," Chapter IV, "The Sea" (McM., $1.10); Kelly, "Leaves from Nature's Story Book," Vol. III, "A Visit to the Bottom of the Ocean" (E. P. C., $0.40); Shaler, "The Story of our Continent," section on "Coral Reefs" (Ginn, $0.75); Tarr, "Elementary Geology," p. 251 (McM., $1.40); D'Anvers, "Science Ladders," Vol. III, Lesson VIII (E. P. C., $0.40). Poems: Shelley, "A Vision of the Sea"; Longfellow, "The Secret of the Sea"; Longfellow, "The Wreck of the Hesperus"; Holmes, "The Chambered Nautilus"; Byron, "The Ocean."

Section VI. Maps. — For References, see bottom of page 110.

Section VII. North America. — Shaler, "The Story of Our Continent" (Ginn, $0.75); Lyde, "North America" (McM., $0.50); King, "The Picturesque Geographical Readers," Second Book (Lee & Shepard, Boston, $0.72).

Section VIII. The United States. — Brooks, "Century Book for Young Americans" (The Century Co., New York, $1.50); Brooks, "The Story of the United States" (The Lothrop Publishing Co.,

Boston, $1.50); Channing, "Students' History of the United States" (McM., $1.40); Ballou, "Footprints of Travel," Chapters I and XXV (Ginn, $1.00); Gannett, "The United States," Stanford's Compendium of Geography (Scribner, $4.50); King, "The Picturesque Geographical Readers," Second Book (Lee & Shepard, Boston, $0.72); "Our Country" (poem), Holmes.

Section IX. New England. — Eggleston, "Stories of American Life and Adventure," "Stories of Whaling" and "A Whaling Song" (A. B. C., $0.50); Rocheleau, "Great American Industries," Book I, "Granite," "Marble," and "Slate"; Book II, "Cotton Manufacturing" and "Lumbering" (A. Flanagan, Chicago, each $0.50); Chase and Clow, "Stories of Industry," Vol. I, "Lumbering," "Ship Building," "Marble and Granite," "Slate and Brick"; Vol. II, "Manufacturing," "Fisheries," and "Whaling" (E. P. C., each $0.40); King, "The Picturesque Geographical Readers," Third and Fourth Books (Lee & Shepard, Boston, each $0.56); Wilson, "Nature Study in Elementary Schools," Second Reader, "The Tree," by Björnson (McM., $0.35). Poems: Whittier, "Mogg Megone"; "Pentucket"; "The Bridal of Pennacook"; "The Merrimack"; The Norsemen"; Longfellow, "The Woods in Winter"; "The Building of the Ship"; "The River Charles"; Emerson, "Boston."

Section X. Middle Atlantic States. — Chase and Clow, "Stories of Industry," Vol. I and Vol. II, various stories on Iron, Coal, Mining, Manufacturing, Farming, etc. (E. P. C., each $0.40); Rocheleau, "Great American Industries," Book I, sections on "Coal Mining," "Natural Gas," "Petroleum," and "Iron" (A. Flanagan, Chicago, $0.50); Eggleston, "Stories of American Life and Adventure," section on "A Story of Niagara" (A. B. C., $0.50); King, "The Picturesque Geographical Readers," Third and Fourth Books (Lee & Shepard, Boston, each $0.56).

Section XI. The Southern States. — Rocheleau, "Great American Industries," Book II, section on "Cotton and Sugar" (A. Flanagan, Chicago, $0.50); King, "The Picturesque Geographical Readers," Fourth Book (Lee & Shepard, Boston, $0.56).

Section XII. The Central States. — Garland, "Boy Life on the Prairie" (McM., $1.50); McMurry, "Pioneer Stories of the Mississippi Valley" (Public School Publishing Co., Bloomington, Ill., $0.50); Rocheleau, "Great American Industries," Book II, sections on "Grain

Raising," "Wheat Raising," and "Milling" (A. Flanagan, Chicago, $0.50); King, "The Picturesque Geographical Readers," Fourth Book (Lee & Shepard, Boston, $0.56). Poems: "When the Frost is on the Punkin," Riley; "Knee Deep in June," Riley; "The Prairies," Bryant; "The Hunter of the Prairies," Bryant.

Section XIII. The Western States. — Ballou, "Footprints of Travel," Chapter XXV (Ginn, $1.00); Eggleston, "Stories of American Life and Adventure," sections on "How Fremont Crossed the Mountains," "The Finding of Gold in California," "Descending the Grand Cañon," and several Indian stories (A. B. C., $0.50); Chase and Clow, "Stories of Industry," Vol. I, several sections on "Mines and Mining" (E. P. C., $0.40); King, "The Picturesque Geographical Readers," Fifth Book (Lee & Shepard, Boston, $0.56); "The Pass of the Sierra" (poem), Whittier; "In the Yosemite Valley," Joaquin Miller.

Section XIV. Alaska. — Ballou, "Footprints of Travel," Chapter XXVI (Ginn, $1.00); Eggleston, "Stories of American Life and Adventure," "Adventures in Alaska" (A. B. C., $0.50).

Section XV. Countries North of the United States. — Coe, "Our American Neighbors," Chapters I–XII (S. B. C., $0.60); Lyde, "A Geography of North America" (McM., $0.50); Dawson, "Canada and Newfoundland," Stanford's Compendium (Scribner, $4.50); Andrews, "Seven Little Sisters," the two sections on Agoonack (Ginn, $0.50); Schwatka, "The Children of the Cold" (E. P. C., $1.25); Gee, "Short Studies in Nature Knowledge" (McM., $1.10); King, "The Picturesque Geographical Readers," Second Book (Lee & Shepard, Boston, $0.72); "An Arctic Vision," Bret Harte; "Evangeline," Longfellow.

Section XVI. Countries South of the United States. — Coe, "Our American Neighbors," Chapters XIII–XVII (S. B. C., $0.60); Conklin, "Guide to Mexico" (D. Appleton & Co., New York, $1.50); Lyde, "A Geography of North America" (McM., $0.50); Ballou, "Footprints of Travel," Chapters XXIII, XXIV, XXV, XXVII, and XXVIII (Ginn, $1.00); King, "The Picturesque Geographical Readers," Second Book (Lee & Shepard, Boston, $0.72).

Section XVII. South America. — Ballou, "Footprints of Travel," Chapters XXIX–XXXI (Ginn, $1.00); Coe, "Our American Neighbors" (S. B. C., $0.60).

Section XVIII. Europe.—Lyde, "A Geography of Europe" (McM., $0.50); Ballou, "Footprints of Travel," Chapters X–XXII (Ginn, $1.00); Coe, "Northern Europe" (S. B. C., $0.60); Pratt, "Northern Europe" (E. P. C., $0.40); Lyde, "A Geography of the British Isles" (McM., $0.50); King, "The Picturesque Geographical Readers," Sixth Book (Lee & Shepard, Boston, $0.60); Pratt, "Stories of England" (E. P. C., $0.40); Andrews, "Seven Little Sisters," "The Little Mountain Maiden," and "Louise" (Ginn, $0.50). Poems: Alice Carey, "The Leak in the Dike"; Longfellow, "Venice"; "The Belfry of Bruges"; "Nuremberg"; "To the River Rhone"; "To the Avon." Joaquin Miller, "Sunrise in Venice"; "In a Gondola"; "To Florence"; Shelley, "Ode to Naples."

Section XIX. Asia.—Ballou, "Footprints of Travel," Chapters III, VIII, and IX (Ginn, $1.00); Andrews, "Seven Little Sisters," "The Story of Pen-se," also "Gemila" (Ginn, $0.50); Smith, "Life in Asia" (S. B. C., $0.60); Pratt, "Stories of India" (E. P. C., $0.40); Pratt, "Stories of China" (E. P. C., $0.40). Poems by Whittier: "The Holy Land"; "Palestine"; "The Pipes of Lucknow."

Section XX. Africa.—Lyde, "A Geography of Africa" (McM., $0.50); Ballou, "Footprints of Travel," Chapters IX and X (Ginn, $1.00); Badlam, "Views in Africa" (S. B. C., $0.72); Andrews, "Seven Little Sisters," section on "The Little Dark Girl" and "Gemila" (Ginn, $0.50).

Section XXI. Australia, etc.—Ballou, "Footprints of Travel," Chapters II, IV, V, VI, VII (Ginn, $1.00); Kellogg, "Australia and the Islands of the Sea" (S. B. C., $0.68); Pratt, "Stories of Australasia" (E. P. C., $0.40). Poem, "Western Australia," O'Reilly.

APPENDIX

CONTINENTS AND PRINCIPAL COUNTRIES

NOTE. — The figures 1897, 1901, etc., refer to the year in which the estimate was made. Most of the figures are obtained from the "Statesman's Year Book" for 1902, or from the "Century Atlas."

	Area in Square Miles		Population
NORTH AMERICA	**8,843,070**	**1900**	**103,500,000**
United States (with Alaska)	3,616,484	1900	76,149,386
Mexico	767,005	1900	13,545,462
Canada	3,653,946	1901	5,369,666
Central America	181,523	1900	4,015,369
Cuba	41,655	1899	1,572,797
SOUTH AMERICA	**7,681,420**	**1900**	**41,200,000**
Brazil	3,209,878	1892	18,000,000
Argentina	1,113,849	1900	4,794,149
Peru	695,733	1896	4,609,999
Chile	279,901	1895	2,712,145
EUROPE	**3,855,828**	**1900**	**376,400,000**
Russia	2,095,616	1900	106,264,136
German Empire	208,830	1900	56,367,178
Austria-Hungary	264,204	1900	46,810,981
France	204,092	1901	38,641,333
British Isles	120,979	1901	41,605,323
Italy	110,646	1901	32,449,754
Spain	197,670	1897	18,089,500
Turkey in Europe	65,752	1901	6,086,300
ASIA (with East Indies)	**16,770,951**	**1900**	**877,000,000**
Chinese Empire	4,234,910	1901	399,680,000
India	1,559,603	1901	294,266,701
Japan	161,198	1898	46,453,249
Turkey in Asia	650,394	1901	17,545,300
Siberia	4,833,496	1897	5,727,090
AFRICA	**11,508,793**	**1900**	**170,000,000**
Kongo State	900,000	1901	30,000,000
Egypt	400,000	1901	9,821,045
Cape Colony	276,775	1901	2,350,000
Transvaal Colony	119,140	1901	1,094,100

	Area in Square Miles		Population
AUSTRALIA	**2,972,573**	**1901**	**3,767,443**
New South Wales	310,367	1901	1,352,297
Victoria	87,884	1901	1,200,918
Queensland	668,497	1901	503,266
South Australia	903,690	1901	362,604
Tasmania	26,215	1901	172,475
Western Australia	975,920	1901	182,553

SIZE OF THE EARTH

LENGTH OF THE EARTH'S DIAMETER at equator (miles)	7,926
LENGTH OF THE EQUATOR (miles)	24,902
THE EARTH'S SURFACE (square miles)	**196,940,000**
Pacific Ocean (square miles)	55,660,000
Atlantic Ocean (square miles)	33,720,000
Antarctic Ocean and the great southern sea surrounding the south pole (square miles)	30,605,000
Indian Ocean (square miles)	16,720,000
Arctic Ocean (square miles)	4,781,000
The sea (square miles)	**141,486,000**

AREA AND POPULATION OF THE UNITED STATES

	Area in Square Miles		Population, 1900
Alabama	52,250		1,828,697
Alaska	590,884		63,592
Arizona	113,020		122,931
Arkansas	53,850		1,311,564
California	158,360		1,485,053
Colorado	103,925		539,700
Connecticut	4,990		908,355
Delaware	2,050		184,735
District of Columbia	70		278,718
Florida	58,680		528,542
Georgia	59,475		2,216,331
Guam	180	(1887)	8,561
Hawaiian Islands	6,449		154,001
Idaho	84,800		161,772
Illinois	56,650		4,821,550
Indiana	36,350		2,516,462
Indian Territory	31,400		391,960
Iowa	56,025		2,231,853
Kansas	82,080		1,470,495
Kentucky	40,400		2,147,174
Louisiana	48,720		1,381,625

	Area in Square Miles		Population, 1900
Maine	33,040		694,466
Maryland	12,210		1,190,050
Massachusetts	8,315		2,805,346
Michigan	58,915		2,420,982
Minnesota	83,365		1,751,394
Mississippi	46,810		1,551,270
Missouri	69,415		3,106,665
Montana	146,080		243,329
Nebraska	77,510		1,068,539
Nevada	110,700		42,335
New Hampshire	9,305		411,588
New Jersey	7,815		1,883,669
New Mexico	122,580		195,310
New York	49,170		7,268,012
North Carolina	52,250		1,893,810
North Dakota	70,795		319,146
Ohio	41,060		4,157,545
Oklahoma	39,030		398,245
Oregon	96,030		413,536
Pennsylvania	45,215		6,302,115
Philippine Islands	114,356	(1901)	8,000,000
Porto Rico	3,550	(1899)	953,243
Rhode Island	1,250		428,556
South Carolina	30,570		1,340,316
South Dakota	77,650		401,570
Tennessee	42,050		2,020,616
Texas	265,780		3,048,710
Tutuila	55	(1891)	3,750
Utah	84,970		276,749
Vermont	9,565		343,641
Virginia	42,450		1,854,184
Washington	69,180		518,103
West Virginia	24,780		958,800
Wisconsin	56,040		2,069,042
Wyoming	97,890		92,531

TWENTY-FIVE LARGEST CITIES OF THE UNITED STATES

NOTE. — The great increase in size of New York is due to the joining of Brooklyn and other cities to it, making Greater New York.

	Population, Census of 1900	Population, Census of 1890
1. New York, N.Y.	3,437,202	1,515,301
2. Chicago, Ill.	1,698,575	1,099,850

		Population, Census of 1900	Population, Census of 1890
3.	Philadelphia, Pa.	1,293,697	1,046,964
4.	St. Louis, Mo.	575,238	451,770
5.	Boston, Mass.	560,892	448,477
6.	Baltimore, Md.	508,957	434,439
7.	Cleveland, O.	381,768	261,353
8.	Buffalo, N.Y.	352,387	255,664
9.	San Francisco, Cal.	342,782	298,997
10.	Cincinnati, O.	325,902	296,908
11.	Pittsburg, Pa.	321,616	238,617
12.	New Orleans, La.	287,104	242,039
13.	Detroit, Mich.	285,704	205,876
14.	Milwaukee, Wis.	285,315	204,468
15.	Washington, D.C.	278,718	230,392
16.	Newark, N.J.	246,070	181,830
17.	Jersey City, N.J.	206,433	163,003
18.	Louisville, Ky.	204,731	161,129
19.	Minneapolis, Minn.	202,718	164,738
20.	Providence, R.I.	175,597	132,146
21.	Indianapolis, Ind.	169,164	105,436
22.	Kansas City, Mo.	163,752	132,716
23.	St. Paul, Minn.	163,065	133,156
24.	Rochester, N.Y.	162,608	133,896
25.	Denver, Col.	133,859	106,713

CITIES OF THE UNITED STATES AND ITS DEPENDENCIES MENTIONED IN THIS BOOK

	Population, Census of 1900	Population, Census of 1890
Albany, N.Y.	94,151	94,923
Allegheny, Pa.	129,896	105,287
Annapolis, Md.	8,402	7,604
Atlanta, Ga.	89,872	65,533
Baltimore, Md.	508,957	434,439
Bangor, Me.	21,850	19,103
Birmingham, Ala.	38,415	26,178
Boston, Mass.	560,892	448,477
Bridgeport, Conn.	70,996	48,866
Buffalo, N.Y.	352,387	255,664
Butte, Mont.	30,470	10,723
Cambridge, Mass.	91,886	70,028
Camden, N.J.	75,935	58,313
Charleston, S.C.	55,807	54,955

	Population, Census of 1900	Population, Census of 1890
Chattanooga, Tenn.	32,490	29,100
Chicago, Ill.	1,698,575	1,099,850
Cincinnati, O.	325,902	296,908
Cleveland, O.	381,768	261,353
Columbus, O.	125,560	88,150
Dallas, Tex.	42,638	38,067
Denver, Col.	133,859	106,713
Detroit, Mich.	285,704	205,876
Duluth, Minn.	52,969	33,115
Fall River, Mass.	104,863	74,398
Galveston, Tex.	37,789	29,084
Gloucester, Mass.	26,121	24,651
Grand Rapids, Mich.	87,565	60,278
Harrisburg, Pa.	50,167	39,385
Hartford, Conn.	79,850	53,230
Havana, Cuba	235,981 (1899)	——
Honolulu	39,306	——
Indianapolis, Ind.	169,164	105,436
Jacksonville, Fla.	28,429	17,201
Jersey City, N.J.	206,433	163,003
Kansas City, Mo.	163,752	132,716
Knoxville, Tenn.	32,637	22,535
Lawrence, Mass.	62,559	44,654
Los Angeles, Cal.	102,479	50,395
Louisville, Ky.	204,731	161,129
Lowell, Mass.	94,969	77,696
Lynn, Mass.	68,513	55,727
Manchester, N.H.	56.987	44,126
Manila, Philippines	350,000 (1901)	——
Memphis, Tenn.	102,320	64,495
Milwaukee, Wis.	285,315	204,468
Minneapolis, Minn.	202,718	164,738
Mobile, Ala.	38,469	31,076
Newark, N.J.	246,070	181,830
New Bedford, Mass.	62,442	40,733
New Haven, Conn.	108,027	81,298
New Orleans, La.	287,104	242,039
New York, N.Y.	3,437,202	1,515,301
Norfolk, Va.	46,624	34,871
Ogden, Utah	16,313	14,889
Omaha, Neb.	102,555	140,452
Paterson, N.J.	105,171	78,347
Pensacola, Fla.	17,747	11,750
Philadelphia, Pa.	1,293,697	1,046,964
Pittsburg, Pa.	321,616	238,617

	Population, Census of 1900	Population, Census of 1890
Portland, Me.	50,145	36,425
Portland, Ore.	90,426	46,385
Providence, R.I.	175,597	132,146
Pueblo, Col.	28,157	24,558
Reading, Pa.	78,961	58,661
Richmond, Va.	85,050	81,388
Rochester, N.Y.	162,608	133,896
Rutland, Vt.	11,499	11,760
Saginaw, Mich.	42,345	46,322
St. Louis, Mo.	575,238	451,770
St. Paul, Minn.	163,065	133,156
Salt Lake City, Utah	53,531	44,843
San Francisco, Cal.	342,782	298,997
Savannah, Ga.	54,244	43,189
Scranton, Pa.	102,026	75,215
Seattle, Wash.	80,671	42,837
Sitka, Alaska	1,396	1,190
Spokane, Wash.	36,848	19,922
Springfield, Mass.	62,059	44,179
Syracuse, N.Y.	108,374	88,143
Tacoma, Wash.	37,714	36,006
Tampa, Fla.	15,839	5,532
Toledo, O.	131,822	81,434
Trenton, N.J.	73,307	57,458
Troy, N.Y.	60,651	60,956
Vicksburg, Miss.	14,834	13,373
Washington, D.C.	278,718	230,392
Wheeling, West Va.	38,878	34,522
Wilkes Barre, Pa.	51,721	37,718
Wilmington, Del.	76,508	61,431
Wilmington, N.C.	20,976	20,056
Worcester, Mass.	118,421	84,655

TWENTY-FIVE LARGEST CITIES OF THE WORLD

		Population
1.	London, England, 1901	4,536,063
	Greater London, 1901	6,580,616
2.	New York, United States, 1900	3,437,202
3.	Paris, France, 1901	2,660,559
4.	Canton, China, 1898	2,500,000
5.	Berlin, Germany, 1900	1,888,326
6.	Chicago, United States, 1900	1,698,575
7.	Vienna, Austria-Hungary, 1900	1,674,957

		Population
8.	Tokio, Japan, 1898	1,440,121
9.	Philadelphia, United States, 1900	1,293,697
10.	St. Petersburg, Russia, 1897	1,267,023
11.	Constantinople, Turkey, 1901	1,125,000
12.	Calcutta, India, 1901	1,121,664
13.	Moscow, Russia, 1897	988,614
14.	Tientsin, China, 1898	950,000
15.	Peking, China, 1898	900,000
16.	Buenos Aires, Argentina, 1900	821,291
17.	Hankau, China, 1897	800,000
18.	Bombay, India, 1901	770,843
19.	Glasgow, Scotland, 1901	735,906
20.	Hamburg, Germany, 1900	705,738
21.	Hangchau, China, 1897	700,000
22.	Liverpool, England, 1901	684,947
23.	Fuchau, China, 1897	650,000
24.	Warsaw, Poland, 1897	638,209
25.	St. Louis, United States, 1900	575,238

IMPORTANT FOREIGN CITIES

	Population
Adelaide, South Australia, 1901	160,691
Alexandria, Egypt, 1897	319,766
Amsterdam, Netherlands, 1900	520,602
Antwerp, Belgium, 1900	285,600
Athens, Greece, 1896	111,486
Bangkok, Siam, 1898	250,000
Barcelona, Spain, 1897	509.589
Belfast, Ireland, 1901	348,876
Berlin, Germany, 1900	1,888,326
Berne, Switzerland, 1901	64,864
Birmingham, England, 1901	522.182
Bombay, India, 1901	770,843
Bordeaux, France, 1901	257,471
Brussels, Belgium, 1901	561,782
Budapest, Austria-Hungary, 1900	732,322
Buenos Aires, Argentina, 1900	821,291
Cairo, Egypt, 1897	570,062
Calcutta, India, 1901	1,121,664
Callao, Peru, 1901	16,000
Canton, China, 1900	2,500,000
Cape Town, Cape Colony, 1891	51,251
Caracas, Venezuela, 1894	72,429

	Population
Christiania, Norway, 1897	200,000
Constantinople, Turkey, 1901	1,125,000
Copenhagen, Denmark, 1901	378,235
Dresden, Germany, 1900	395,349
Dublin, Ireland, 1901	286,328
Edinburgh, Scotland, 1901	316,479
Geneva, Switzerland, 1901	105,139
Glasgow, Scotland, 1901	735,906
Hague, The, Netherlands, 1900	212,211
Halifax, Nova Scotia, 1901	40,787
Hamburg, Germany, 1900	705,738
Havre, France, 1901	129,014
Hongkong, China, 1901	297,312
Jerusalem, Turkey in Asia, 1901	42,000
Johannesburg, Transvaal Colony, 1896	102,078
Kimberley, Cape Colony, 1891	28,718
Leipzig, Germany, 1900	455,089
Lima, Peru, 1891	103,956
Lisbon, Portugal, 1900	357,000
Liverpool, England, 1901	684,947
London, England, 1901	4,536,063
London, Greater, 1901	6,580,616
Lyon, France, 1901	453,145
Madras, India, 1901	509,397
Madrid, Spain, 1897	512,150
Malaga, Spain, 1897	125,579
Manchester, England, 1901	543,969
Marseille, France, 1901	494,769
Mecca, Turkey in Asia, 1900	60,000
Melbourne, Victoria, 1901	493,956
Mexico, Mexico, 1895	344,377
Milan, Italy, 1901	491,460
Mocha, Turkey in Asia, 1900	5,000
Montevideo, Uruguay, 1897	249,251
Montreal, Canada, 1901	266,826
Moscow, Russia, 1897	988,614
Munich, Germany, 1900	499,959
Naples, Italy, 1901	563,731
Odessa, Russia, 1897	405,041
Ottawa, Canada, 1901	59,902
Para, Brazil, 1892	65,000
Paris, France, 1901	2,660,559
Peking, China, 1898	900,000
Prague, Austria-Hungary, 1900	201,589
Quebec, Canada, 1901	68,834
Rio de Janeiro, Brazil, 1890	522,651

	Population
Rome, Italy, 1901	463,000
St. John, New Brunswick, 1901	40,711
St. Petersburg, Russia, 1897	1,267,023
Santiago, Chile, 1900	291,725
Shanghai, China, 1900	620,000
Singapore, Malay Peninsula, 1901	228,555
Stockholm, Sweden, 1900	300,624
Sydney, New South Wales, 1900	451,000
Teheran, Persia, 1897	210,000
Tientsin, China, 1897	950,000
Tokio, Japan, 1898	1,440,121
Toronto, Canada, 1901	207,971
Trieste, Austria-Hungary, 1900	134,143
Valparaiso, Chile, 1900	135,674
Vancouver, Canada, 1901	26,196
Venice, Italy, 1901	151,841
Vera Cruz, Mexico, 1895	88,993
Victoria, Canada, 1901	20,821
Vienna, Austria-Hungary, 1900	1,674,957
Warsaw, Poland, 1897	638,209
Winnepeg, Canada, 1901	42,336
Yokohama, Japan, 1898	193,762
Zürich, Switzerland, 1901	152,942

HEIGHT OF A FEW MOUNTAIN PEAKS

	Feet
Mt. Everest, Himalaya Mountains, Asia	29,002
Aconcagua, Andes Mountains, Chile	22,860
Mt. McKinley, Alaskan Mountains, Alaska	20,464
Mt. Logan, Coast Ranges, Canada	19,500
Mt. Elburz, Caucasus Mountains, Russia	18,200
Orizaba, Sierra Madre, Mexico	18,314
Mt. St. Elias, Coast Ranges, Alaska	18,100
Mt. Blanc, Alps Mountains, France	15,781
Mt. Whitney, Sierra Nevada Mountains, California	14,898
Mt. Rainier, Cascade Mountains, Washington	14,526
Mt. Shasta, Cascade Mountains, California	14,380
Pikes Peak, Rocky Mountains, Colorado	14,108
Mauna Loa, Hawaiian Islands	13,675
Fremont Peak, Rocky Mountains, Wyoming	13,790
Fujiyama, Japan	12,365
Mt. Mitchell, Appalachian Mountains, North Carolina	6,711
Mt. Washington, White Mountains, New Hampshire	6,293
Mt. Marcy, Adirondacks, New York	5,344

SOME OF THE LARGEST RIVERS OF THE WORLD

Name	Country	Length in Miles	Basin Area	Ocean
Missouri-Mississippi	United States .	4,300	1,257,000	Atlantic
Nile . . .	Africa . .	3,400	1,273,000	Atlantic
Amazon . .	South America .	3,300	2,500,000	Atlantic
Ob	Siberia . .	3,200	1,000,000	Arctic
Yangtse Kiang .	China . .	3,200	548,000	Pacific
Kongo . . .	Africa . .	2,900	1,200,000	Atlantic
Lena . . .	Siberia . .	2,800	950,000	Arctic
Hoang-Ho . .	China . .	2,700	570,000	Pacific
Niger . . .	Africa . .	2,600	563,300	Atlantic
Plata . . .	South America .	2,580	1,200,000	Atlantic
Mackenzie . .	Canada . .	2,000	590,000	Arctic
Volga . . .	Russia . .	2,400	563,300	Caspian
St. Lawrence .	North America .	2,200	519,000	Atlantic
Yukon . .	Alaska . .	2,000	440,000	Pacific
Indus . . .	India . .	1,800	372,700	Indian
Danube . .	Europe . .	1,770	300,000	Atlantic

TEN OF THE GREAT LAKES OF THE WORLD

Name	Length in Miles	Breadth in Miles	Area in Square Miles	Country
Caspian	680	270	169,000	Russia
Superior	390	160	31,200	U.S. and Canada
Victoria Nyanza	230	220	30,000	Africa
Aral	225	185	26,900	Asiatic Russia
Huron	250	100	17,400	U.S. and Canada
Michigan	335	85	20,000	United States
Tanganyika .	420	50	12,650	Africa
Baikal	397	45	12,500	Siberia
Erie	250	58	10,000	U.S. and Canada
Chad (a shallow lake which grows very large in the rainy season and shrinks in the dry season)			about 10,000	Africa

APPROXIMATE AVERAGE HEIGHT OF SOME PLATEAUS

	Feet
Tibet	10–15,000
Bolivia	10–13,000
Spain	2,000–3,000
Mexico	5–6,000
Western United States Plateau	5–6,000
Brazil	2,000–2,500

INDEX OF PLACES AND PRONOUNCING VOCABULARY.

KEY TO PRONUNCIATION.

a, as in *fat*; *ā*, as in *fate*; *ä*, as in *far*; *â*, as in *fall*; *e*, as in *pen*; *ē*, as in *mete*; *ė*, as in *her*; *i*, as in *pin*; *ī*, as in *pine*; *o*, as in *not*; *ō*, as in *note*; *ö*, as in *move*; *u*, as in *tub*; *ū*, as in *mute*; *u*, as in *pull*; *g*, as in *get*; *ġ*, as in *gem*; *c*, as in cat; *ç*, as in *cent*.

A double dot under a or o (a̤, o̤) indicates that its sound is shortened to that of *u* in *but*.

Italicized letters are silent. The sign ′ tells upon which syllable the accent is placed. The numbers refer to pages in the book excepting where Fig. is before them, when they refer to figures in the book.